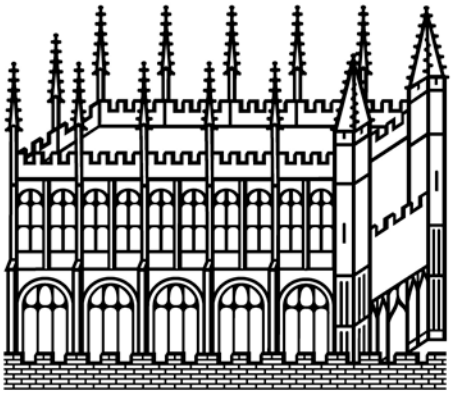

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AMERICA.

131. The remaining points proposed for communication are in South America. 5. The river Atrato, which empties into the Gulf of Darien, approaches in two points by its branches to the Pacific. 6. The Naipa, which enters near its mouth, is navigable to a point within five or six leagues of the port and bay of Cupica, which should be the Suez of the new continent. The interval is quite level, and well adapted for a canal. 7. Near the source of the Atrato a small branch, called the River Quito, is connected by the small ravine of Raspadura with the head waters of the St. Juan, which empties into the Pacific. By the energy of a single priest and his parishioners, a small canal was dug in 1788 along the ravine, by which canoes laden with produce pass from sea to sea during the time of heavy rains.

It is obvious that no point yet examined presents so few difficulties in the way of this great object; and the government of Columbia have directed the necessary surveys to be made in reference to it. Of the two remaining routes, that which was suggested from the Gulf of St. George to the ocean is quite impracticable: the other presents a communication comparatively easy, by a portage over the mountains of only five or six leagues from the river on the Peruvian coast, 10° south latitude to the branches of the Amazon, and would carry the rich produce of Peru and Chili to the mouth of the Amazon and the coast of Europe in five or six weeks; while a passage of four months, attended with great danger, is necessary in going round Cape Horn. The jealousy of the Brazilian government at present renders the plan impracticable. The only canal yet executed in the peninsula of North America is the great drain, or deragne of Huehuetoca, designed to draw off the waters by which the valley and city of Mexico are frequently inundated. Although it serves no commercial purpose, it claims admiration as one of the most gigantic hydraulic constructions in the world. It was originally a subterraneous passage through the crest of mountains which surrounds the valley of Mexico; but, being found inadequate, it was converted at an immense expense into an open drain, more than twelve miles in length and nearly 200 feet in depth in some parts, and 200 or 350 feet broad; in some parts nearly equal to the Seine at Paris. If but a small part of it were filled with water, ships of war might pass through the mountains. It is now much fallen to decay.

132. Climate.—It is a well-known fact, that the temperature of countries on the eastern coast of North America, beyond the limits of the tropical heats, corresponds to that of countries seven or even ten degrees farther north in Europe. Various causes have been assigned for this difference, none of which have appeared satisfactory. The prevalence of north-west winds, the extensive forests, the great lakes, the extent of land on the north in America, have all been alleged as the causes of this supposed anomaly in climate.

133. But all these theories proceed on the ground that the temperature of Europe is that which is naturally produced by its latitude. The fact really is, that scarcely any other portion of the globe, of the same extent, is so much subject to the influence of local causes: it is sheltered from the bleak winds from the north by the Scandinavian chain of mountains: it is surrounded on the north by the ocean immediately communicating with the Atlantic, and intersected by extensive seas whose waters preserve an equable temperature, and give it out to moderate the severity of winter. Its southern countries are still more sheltered by ranges of mountains passing from east to west; and are bordered by a sea extending into a hot climate, and transporting its heats by currents and winds with great rapidity. The deserts of Africa on the south are like immense furnaces, raising the temperature of all the surrounding countries. America on the other hand is exposed to the common influences of the season without shelter, and would therefore be more likely to furnish a fair standard of the temperature of the earth. But we shall find, on further examination, that the eastern coasts of both continents, so far as they have been examined, appear to resemble each other, and to have colder climates than the western. The eastern coast of Asia resembles that of North America in the greater severity of its climate. On the other hand, the western coast of America, so far as it has been explored, has been found to have a climate milder than the eastern. The most important circumstance, probably, which is concerned in producing the more elevated temperature of Europe, is the prevalence of south-west winds upon its western coast. How far this is the case on the western coast of America we are not informed; but it is well known that the south-west wind, coming of course from a warm climate, blows about two-thirds of the year upon the western coast of Europe, and therefore continually modifies its climate by mingling the warm air of the tropics in its atmosphere. In correspondence

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with this view we shall find that the cold increases in going into the interior of Europe. The growth of plants in Russia, where we have no accounts of temperature, indicates a temperature still lower in that country; and the strongest evidence is furnished that, in moving inland, we are leaving some important source of heat. That it is not merely the ocean which causes the difference, is evident from the fact that no such change occurs on the eastern coast of America; and we are left without any other means of accounting for it than the prevalence of the wind we have mentioned. It is a singular fact, also, that the lines described by Mr. Young as bounding the various climates of France, instead of following the parallels of latitude, pursue a course perpendicular to the direction of this wind, as if this were the governing cause, rather than distance from the diurnal path of the sun.

134. If we add to this, that the prevalent winds on the coast of America are from the north-east and north-west, we shall have good grounds for anticipating a great difference of temperature from these sources alone. The combination of causes we have mentioned justifies the opinion, that America is probably a better standard for the general temperature of the earth than Europe, and all the accounts we have of Asia confirm this opinion.

135. The following table, presenting a comparative view of the mean temperature of places in the same latitude, but in different situations, affords an illustration of the remarks which we have made.

MEAN ANNUAL TEMPERATURE.

Lat.	Western Europe and Africa.	Eastern Coast of Asia, and interior places.	Eastern Coast of America.
2°	. . . . . deg.	. . . . . deg.	. . . . . deg.
10½	. . . . .	. . . . .	Cumana . . . 81.5
12	Pondicherry . . 81.3		
13	Madras 80.4		
14	. . . . .	Manilla 78	
15	Senegambia . . 79	. . . . .	17° Antilles . . 81
19	. . . . .	. . . . .	Vera Cruz . . . 78.8
23	Calcutta . . . 78.5	Canton . . . 75	Havannah . . . 77.9
30	Cairo 72.7	. . . . .	29½° Florida . . 68
31½	. . . . .	. . . . .	Natchez 64.8
33	. . . . .	. . . . .	Fort Johnson . . 66
34	. . . . .	. . . . .	Huntsville . . . 63
36	Algiers 72	. . . . .	Raleigh 59
37	. . . . .	. . . . .	Williamsburgh . 60.8
38	Palermo . . . 63.5		
39	. . . . .	. . . . .	Washington . . 58.1 Cincinnati . . . 54.2
40	. . . . .	Pekin 54.8	Philadelphia . . 54.8
41	Naples 63.5	Madrid . . . . 59.7 (elevated 1978 feet.)	New York . . . 53.8
41½	Rome 60.4	. . . . .	Providence . . . 44.7
42½	. . . . .	. . . . .	Boston 48.6
43	Mid. France . 59 Toulon . . . 62	Marseilles . . 58.8	Salem . . . . 45.3 Williamstown . 45
44	Nismes . . . 60.3 Genoa 60.6	Bologna 56	Brunswick . . 43 Middlebay . . 43
45	Bourdeaux . . . 56.5	Padua 52.2	St. Peter's Reach . 43
46	. . . . .	Geneva 49.3	
47	Nantes 54.6	. . . . .	Quebec . . . 41.7
48½	St. Malo . . . 54.1	Vienna 50.5	St. George's Bay . 41
49	Paris 52		
50	. . . . .	Prague 49	
51½	London. . . . 51.8	Gottingen . . . 46.9	
52	Amsterdam . 53.4	Warsaw 48.6	
53	Dublin 50.1		
53½	. . . . .	Berlin 49	
54	York 49	. . . . .	Table Bay . . . 32 (Labrador).
55	Copenhagen . . 45	Moscow . . . 40.1	
56	Edinburgh . . . 47.7		57° Nain, Lab. . 26.8
58½	Orkney Islands . 45.7	. . . . . .41.	Fort Churchill . 25
60	Upsal . . . . 41.9 Christiana . . 42.8	Stockholm . . . 42.2 Petersburgh . . 38.8	
63½	Drontheim . . . 39.9		
64	. . . . .	Umea 33.3	
70	Wadso, Lap. . . 36	68° Enontekis . . 26.8	
71	Mageroe Isle . . 32	. . . . .	(Arctic Regions).
72½	. . . . .	. . . . .	Melville Isle . . 1.3

136. It will be most convenient to consider the continent as it is divided by the gradations of temperature, or isothermal lines, into various regions, distinguished by the same prominent characteristics of climate, and furnishing similar productions. For this purpose we shall describe particularly the course of the principal isothermal lines; and, in order to furnish the best opportunity for comparison, we shall trace them in their progress over the eastern continent, relying chiefly on the original and interesting papers on this subject, which have been published by Baron Humboldt. It has been said that the climate of America is growing milder, as the forests are destroyed; but it is by no means proved. On the contrary, the mean temperature does not appear to have varied. At the same time it is true that the winters have become shorter and more open, while the spring and summer are proportionably colder, and the seasons are less uniform. Changes of the same nature, however, take place in Europe; and in Europe, as well as in America, a series of mild seasons contrasted with some preceding seasons of uncommon severity, has been made the ground of a false conclusion as to the amelioration of the climate.

137. The coldest, or frozen region of North America, may be considered as extending from the northern limits of the isothermal line of forty-one degrees, which corresponds nearly to the utmost northern limit of the oak and wheat. The last oaks are seen on the coast of Norway, in latitude sixty-three degrees; on the gulf of Bothnia, above sixty degrees; in Russia, at fifty-five degrees; and in Siberia, still lower. In North America this line is found at the bay of St. George in Newfoundland, in latitude forty-nine, and generally at fifty degrees on the eastern coast; but it rises higher on the western. In the coldest parts of this region brandy and mercury freeze during the winter; and masses of snow and ice continue through the summer, covering a large part of the country. Wells are frozen at a great depth; and at Hudson's Bay, and in most parts of this region, no water can be obtained in winter, except by melting snow and ice. At the depth of three feet the ground is frozen in summer at Hudson's Bay; and lakes and standing waters of no great depth are frozen to the bottom in the winter. The inland waters continue frozen from seven to nine months; and snow, which begins to fall in August, continues from eight to ten months in all parts.

138. During the winter, the inhabitants of the coldest parts remain crowded together in small huts. The whole inside of a hut or ship is usually lined with ice, formed from the vapour of the breath, which must be cut away every morning. The savages even build huts of snow, stop the openings with ice, and use it as glass. Every part of the body must be covered in going out, or it is instantly frozen. The air, when breathed, seems to pierce and even rend the lungs. The cup often freezes to the lips, if it is touched in drinking. The provisions must be cut with hatchets and saws. Trees and the beams of houses are split by the frost, and rocks rent with a noise like that of fire-arms. Meat is preserved here in a frozen state without any care. The snow forms smooth and permanent paths for sleds, over which they travel with great rapidity, chiefly with rein-deer and dogs.

139. The change from winter to summer is very sudden, and the valleys are covered with grass a few days after the snow has melted. The temperature of the summer is very uniform; and the heat of the sun is often oppressive from the length of the days. In most parts of this region the summer is too short to bring grain to maturity. Cultivation is practised only to a very limited extent, and without any certainty of a crop, although this part of North America is in the same latitude with Denmark and Great Britain.

140. At Melville Island, the extreme point of Captain Parry's voyage, he states the mean annual temperature to be only one degree and a half, while at the North Cape of Europe, nearly in the same latitude, it is thirty-two degrees.

141. The isothermal line of 50°. corresponding nearly to the limit of the wine-grape in the middle of Europe, there passes along the parallel of 50°.; on the western coast it ascends to 52°.; and in England, to 54°.; but in going eastward from Germany, it continually descends; and we find it as low as 45°. in Asia. But in North America, it commences on the coast at Boston, in latitude 42°. On reaching the basin of the Mississippi, beyond the Hudson River, it ascends to the borders of the great lakes: it descends again beyond the Mississippi; but again rises beyond the Chippewan Mountains; and is supposed by Humboldt to strike the western coast in latitude 50°. The region north of this line, extending to the utmost limits of the oak, may be termed the Cold Region, embracing the British provinces and the northern part of New England. In this region the winters commence in November and end in April. The change of seasons is sudden; frosts begin in September, and often continue through the month of May. The air is keen and penetrating, but clear and salubrious; and the climate appears remarkably favourable to long life. The cold is remarkably steady; and it is said that it is more easily endured, than that of milder climates, which are subject to frequent changes. The snow is permanent; and the sled-roads afford a rapid and easy mode of transportation through the winter. In Nova Scotia and Canada the rivers freeze to the thickness of several feet, and snow lies through the winter; while in France, in the same latitude, snow is rare, and the rivers are seldom frozen at all.

142. Little vegetation appears in the interior before April, and then springs up immediately after the snows are melted. The summers are short, but hot, and sometimes oppressive. They are as warm at Quebec as in the middle of France. The climate is adapted to the coarser grains; but wheat flourishes chiefly in the southern parts. The pastures are rich, and the verdure fine. Apples, pears, cherries and plums are easily cultivated, of the finest quality, and in the greatest abundance. All the species of berries are abundant, and some very delicious, as strawberries, gooseberries, &c. The

walnut, and most of the ordinary nuts, and the common garden vegetables, peas, cabbage, turnips, potatoes, &c. flourish best. It is also the native climate of oats, hemp, and flax, and the most favourable for their cultivation.

143. At the northern limits of this region, the oak commences, and the forests are composed of the oak, the elm, the maple and the beach, instead of the birch, willow, fir and pine.

144. The isothermal line of 59°. passes through Raleigh, in the United States, in latitude 35°.; but in Europe it ascends to 44°. and passes between Rome and Florence; extending north of Greece and the Black Sea to the Caspian Sea. It descends probably to latitude 35°. after passing the great table-land of Asia. On the western coast of North America, it ascends to 37°. or 38°. and perhaps still higher. Between the line of 59°. and that of 50°. before described, is the temperate region, whose climate in North America may be rather termed a mixture of the cold and hot. This region includes the southern part of New England and the Middle states, with the more elevated regions of Maryland and Virginia, and the Western states on the Ohio. Tennessee, and the western parts of the Carolinas, from their elevation, partake of the same climate.

145. The mean annual temperature is the same as in this region in Europe; but it is differently distributed. In the Atlantic states, the climate is marked by extremes of heat and cold, resembling the south of Europe in summer, and the middle regions in winter. But the weather is variable, and neither lasts long at a time. Philadelphia has summers as hot as Montpelier and Rome, while its winters are like those of Vienna. New York has the summer of Rome, and the winter of Copenhagen. Quebec is as warm as Paris in summer; and as cold as Petersburgh in winter. The eastern coast of Asia appears to be characterised by equal or greater extremes of temperature; for Pekin is hotter than Cairo in summer, and as cold as Upsal in Sweden in winter.

146. The Atlantic states are sheltered by no ranges of mountains on the north, east, or south, and hence the climate is variable. The cold of the northern regions, the heat of the southern, the moisture of the sea-air, and the dryness of the mountainous regions, are alternately transported to them by the winds. The changes are frequent and sudden; and give rise to many diseases from which more settled climates are exempt. The winters are short, and often wet. The spring is damp and chilly; the summer has excessive heat during the day, and usually cool nights. The autumn is a serene, delightful season, often extending to the latter part of December.

147. From the influence of the great lakes, the temperate region extends farther north in the interior than on the coast; and beyond Lake Erie, reaches to the latitude of the southern point of Lake Huron. The states west of the Alleganies, and especially in the mountainous districts south of Pennsylvania and the River Ohio, are not liable to the same extremes of heat and cold. The winters are commonly milder, and cattle remain abroad throughout the year. The spring is earlier, and the weather is generally more serene and settled. But the basin of the Mississippi is open to the winds from the torrid and frozen regions, and is therefore liable to very great changes. The temperature has sometimes varied on the Mississippi sixty degrees in the course of a month; while in Philadelphia, Washington, and Detroit, the variation in the same month was only from thirty to forty degrees.

148. In the elevated regions of the southern United States, lying among the Allegany Mountains, the temperate region of the middle states extends as far south as thirty-one degrees. From this circumstance, Tennessee enjoys a temperate, delightful climate; and the neighbouring parts of Georgia and the Carolinas, which lie on the sides of the mountains, are also free from the excessive heats and violent diseases of the low country. The next important line which is distinctly marked, is that of 68°. which corresponds nearly to the northern limit of the sugar-cane and coffee, and is generally the most southern limit of snow. In North America it is almost coincident with the parallel of 30°. or 31°. on the eastern coast; while on the other side of the Atlantic we find the same plants, and a corresponding temperature in latitude 37°. in the south of Spain, Sicily, Asia Minor, and Syria; but on reaching Persia it descends to 30°.: it is still lower in passing round the table-land of Tartary; and probably does not extend beyond 30°. in China.

149. The warm regions extend from the boundaries of the temperate region to the northern limit of the sugar-cane, lying between the isothermal lines of 59°. and 68°.; and of course have a temperature intermediate between these. The frosts are not severe in the plains; snow is rare, and the waters are seldom frozen over. The winters are distinguished more for dampness than cold, resembling the spring of the temperate regions. The more delicate fruits, as the olive, the fig, &c. flourish; and vegetables grow during seven or eight months of the year. The level portions of the southern United States, which lie in the warm regions, have a different climate from the corresponding countries in Europe, on account of the moisture which prevails. Vegetation is abundant, marshes are numerous, and the heat is therefore less scorching; but they are not usually favoured with a salubrious air. Noxious effluvia are continually formed; and there is a general tendency to bilious diseases and fevers, especially of the intermittent kind. The autumn is almost uniformly sickly; and the countenances of the inhabitants have a pale and sallow cast, instead of the bloom and freshness of more northern climates, or the brunette of the southern Europeans.

150. On passing the isothermal line of sixty-eight degrees, corresponding in America to the thirtieth or thirty-first parallel of latitude, we meet with the sugar-cane and coffee for the first time; and find ourselves in a tropical climate, whose characteristics vary very little, except in the gradual increase of temperature from the frigid to the opposite extreme of the torrid zone. In the level tracts of this region frost and snow

are unknown; the trees are covered with perpetual verdure, and the various periods of flower and fruit in different plants are the chief indications of season. The mean temperature varies from seventy to eighty degrees; the heat of summer is oppressive to the natives, and dangerous to strangers; exposure to the sun in the middle of the day is hazardous for both. Those districts which are nearly at the level of the sea, are still more subject to the noxious effluvia which we have described in the warm regions; and are annually visited by that dreadful scourge of hot climates, the malignant bilious or yellow fever. Few strangers who visit these countries in the hottest season escape the disease, although many survive its attacks. On the coast of Mexico it is not uncommon for a traveller to experience a fatal attack, merely in passing from the high country to embark for Europe.

151. The insular situation of the West Indies of course modifies their climate, as will be fully described under that head. The continent itself in this portion is so generally elevated above the level of the sea, that it has every variety of climate from that we have been describing to that of the temperate regions. Immediately above the Tierras Calientes, or hot regions of the coasts, we find on the declivity of the table-land the Tierras Templadas or temperate regions, commencing at the height of 4000 or 5000 feet. A soft spring temperature perpetually reigns here, which never varies more than eight or ten degrees; the mean annual temperature is sixty-eight or seventy, corresponding to that of the regions last described; the extremes of heat and cold are equally unknown, and the malignant fever never reaches the borders of these favoured tracts: they are only incommoded by frequent thick fogs, in consequence of this being the usual elevation of the clouds. At the height of 7000 feet the Tierras Frias or cool regions commence, which extend over the table-land; the mean temperature is less than sixty-two degrees, or corresponds to that of Rome; it is rare that the thermometer falls below the freezing point; the winters are as mild as at Naples, having a mean heat of from fifty-five to seventy degrees; in summer the thermometer in the shade never rises above seventy-five. Some districts of limited extent rise still higher than this, and experience a severity of cold which is disagreeable and unfavourable to vegetation.

152. With regard to the country near the sources of the Rio del Norte, it is observed by Pike, that 'no person accustomed to reside in the temperate climate of thirty-six and thirty-seven degrees of north latitude, in the United States, can form any idea of the piercing cold in that parallel in New Mexico; but the air is serene, and unaccompanied by damps and fogs, as it rains but once in the year, and some years not at all. It is a mountainous country. The grand dividing ridges, which separate the waters of the Rio del Norte from those of California, border it on the line of its western limits, and are covered in some places with eternal snows, which give a keenness to the air that could not be calculated upon nor expected in a temperate zone.'

The prevalent winds of North America are from the north-east and north-west, sweeping between the chain of mountains, and in the same directions. The south-west appears to be next in frequency, produced in part by the re-action of the atmosphere after the preceding. The north-easterly winds are usually loaded with cold vapours, and are peculiarly piercing. The westerly and north-westerly winds are generally dry, and produce a clear and invigorating state of the air. The south-westerly winds are of course warm; and, as they bring the vapours of the gulf of Mexico, they render the atmosphere moist, producing rain in winter, and a sultry heat in summer. The frequent alternations of these winds produce the sudden and unwholesome changes so much complained of in the American climates.

153. The quantity of rain is greater than in those countries of Europe which have the same mean temperature; but, in consequence of its falling more rapidly, the number of clear days is generally greater than in any country of Europe north of the Alps and west of Russia. These facts will be seen on the examination of comparative tables.

The following table shows the quantity of rain which falls annually, in a number of places on both continents, arranged according to the amount.

	Inches.
Grenada, (W. I.)	112
Calcutta	81
Charleston, (S. C.)	54
Frankfort, (Ken.)	54
Andover, (Mass.)	51
Williamsburgh (Vt.)	47
Cambridge	47
Vienna	44.8
Pisa	43.2
Rutland (Vt.)	41
Brunswick, (Me.)	40
Naples	37
Charleston, (Mass.)	36
England (average)	36
Cincinnati	36
Rome	35.7
Salem	35
Liverpool (18 years)	34.1
Zurich	32
Philadelphia	30
Scotland (average)	30.1
Algiers	29.2
Padua	25.2
Abo	25
Williamstown (Mass.)	25
Palermo	22
London	22
Marseilles	21.4
Paris	20.8

The average number of rainy days in a year, for twenty years, in Salem and Cambridge in Massachusetts, and in twenty cities in Europe, is stated as below, with the number of clear and cloudy days for one or two years. The other statements are for one year only.

	Rainy.	*Clear.*	*Cloudy.*
Salem	95	173	90
Cambridge	88	208	69
20 cities in Europe	122	64	113
Philadelphia	64	216	85

	Rainy.	*Clear.*	*Cloudy.*
Washington - -	84	222	58
Council Bluffs Missouri River -	59	236	73
Florida - - - - -	40	257	68
Pittsburg - - - -	65	210	55

154. VEGETABLES.—A continent embracing such a variety of soil and climate of elevation and exposure, can scarcely be deficient in any important vegetable production. Some of its native plants have become articles of necessity in Europe; as maize potatoes, and tobacco. Almost all civilized nations use its cotton for clothing. Every species of grain which has been brought from Europe flourishes as well as in its original soil. Rice is as fine as in the East Indies. Garden vegetables are reared with great ease, and in abundance. In the tropical regions of Mexico, the banana and the manioc or cassava have been from time immemorial the chief support of the inhabitants; and the maguey furnished the Mexicans with a substitute for wine; while it supplied them with materials for ropes, cloth, and paper. Every species of fruit is reared on this continent in the highest perfection; in short, nothing is wanting in the vegetable world to render it independent of all other countries, except some of the finest spices and tea; while immense supplies of vegetable food and clothing, and other useful products, are sent abroad. It abounds also with natural meadows, which rear cattle almost without attention from the herdsman; and in some districts immense herds have sprung from those which escaped from European settlements.

155. America surpasses other quarters of the globe in the variety and size of its trees, and the grandeur of its forests. There are 137 species of trees in North America, whose height exceeds thirty feet; while in Europe scarcely forty-five attain this height. Of seventy-four known species of the oak, forty belong to North America. Sixteen of these are found in Mexico; the remainder in the more northern portions of the continent, extending to latitude fifty or fifty-five degrees north. The live oak, which is found on the southern portion of the coast of the United States, from Virginia to the Mississippi, is scarcely inferior to the teak-tree of India for ship-building. It is chiefly on the islands, and seldom extends more than fifteen or twenty miles from the shore. The white oak, which abounds in the middle United States, and attains the height of seventy or eighty feet, is most used and valued of all the species for common purposes. Several other kinds yield a bark which is much used in dyeing; and is exported for this purpose in considerable quantities.

156. There are fourteen species of the pine and spruce tree, extending through every degree of latitude, and in great abundance. They furnish valuable timber in large quantities for masts and spars as well as for building; and several species are very valuable for the turpentine, pitch, and tar, which are manufactured from them. The white pine is the most magnificent; often towering to the height of 100 or 150 feet. It flourishes in the northern and mountainous regions of the United States, and in Canada.

157. The cedar, which is so much valued for its odour and durability, grows on the southern borders of the United States. The sugar maple, which furnishes good sugar in considerable quantity, is abundant in the northern and middle United States, and is also found in Canada and Nova Scotia. The chestnut and walnut are common, and produce fine nuts. The cherry, mulberry, and crab-apple, are also natives of North America. The cherry, and some species of the maple and bay tree, furnish valuable woods for ornamental purposes. The magnolia combines the grandeur of a forest tree, with the beauty and fragrance of a flowering shrub; and the bay is scarcely less conspicuous for beauty. The birch, beech, elm, and other common forest trees, abound in their customary latitudes; and there are many species of inferior value which are peculiar to this continent. The forests of America supply some of its most valuable articles of commerce. The timber and lumber of various kinds, formed from the oak and pine, are exported in large quantities. The potash and pearl-ash, produced in clearing and burning the forests preparatory to cultivation, are also important articles of trade. The pine forests, especially of the southern states, furnish a large supply of naval stores to the countries of Europe.

158 ANIMALS.—The quadrupeds of America are far from exhibiting those symptoms of degeneracy, when compared with the same species on the eastern continent, which Buffon imagined was a necessary result of the inferiority of the new world. The immense skeletons of the mastodon, usually termed the mammoth, discovered in the western states, indicate that the continent was once the residence of animals not less majestic or powerful than the elephant. The beasts of prey are as numerous, and those of the same species as fierce as those of the old continent. But no portion of the continent appears to present any rival to the lion of Africa, and the tiger of Bengal. The brown bear of Missouri rivals or surpasses that of the Alps in strength and ferocity; and indeed is thought to be surpassed by no beast of prey in power and courage. Other species of the bear resemble those of Europe. Various species of the wolf are found, which exhibit a great degree of sagacity and courage. It is supposed that animals of this species were tamed and employed by the Indians in hunting in the place of dogs.

159. The cougouar, a native animal, called also the American panther, resembles the panther of Asia and Africa in shape. It is occasionally seen in every part of the continent, with different varieties of form and colour; and is possessed of considerable strength and courage. The catamount is next in size to the cougouar. It is a strong and ferocious animal, and, like the cougouar, often leaps upon the neck of cattle and deer, and destroys them by tearing open the veins of the neck, while it is secure from the rage of the animal it attacks. There are four species of the lynx or wild cat, which were formerly very numerous, but, in common with other beasts of prey, have been almost destroyed or driven back into the wilderness of the interior by the progress of population. The wolverine and the kingajou

are smaller carnivorous animals, with habits similar to those of the cougouar and catamount.

160. The skins and fur of these animals are valuable, especially that of the bear. There are several species of the fox, designated by names derived from their colour—red, grey, &c.: the fur is very useful; and that of the black fox is among the most valuable furs. The ermine is also found in the northern United States. The badger or carcajou, weasel, marten, and several species of otter, are common in North America, and add to the supply of furs. The racoon is an active sagacious animal, resembling the fox in size and shape, and producing a coarse fur. The skunk or pole-cat is a small animal which defends itself from its pursuers by emitting a fluid of the most disgusting odour, which renders any thing on which it falls so offensive that it cannot be used until a length of time has elapsed.

161. The American forests abound with the various species of squirrels. Seven species were observed by Lewis and Clark, west of the Mississippi river. The flying squirrel is a small but beautiful animal, remarkable for a membrane two or three inches broad, extending from the fore to the hind legs, on each side of the body, which it uses to aid its progress and sustain its weight in leaping from tree to tree. Rabbits are also numerous; but the European hare has not been discovered. The American marmot, known under the names of the wood-chuck or ground-hog, is about the size of a rabbit, but more resembling a rat in its form: it burrows like the rabbit; and is hunted for its flesh and fur.

162. The Missouri marmot or Prairie dog is found in great numbers in the Missouri country, and is remarkable for its singular habits. These animals live in families, and burrow to a considerable depth. The sites of their towns are generally on the brow of a hill near some stream or pond, but sufficiently elevated to escape inundation. They sometimes extend over two or three square miles. Their holes descend in a spiral form, and to such a depth, that it is impossible to drive them out. In approaching one of their settlements, you are saluted on all sides by the cry of *wish-ton-wish*, uttered in a shrill piercing manner, like the bark of a small dog, from which the Indian name of the animal is copied. At this signal they all retreat to the entrance of their burrows, and post themselves in watchful attention to your motions. It is remarkable that their towns are infested with rattle-snakes to such a degree, as to render it dangerous to pass through them. The jerboa of Canada is a little animal of the mouse kind, which frequents the meadows and corn-fields as well as the forest, remarkable for its rapid jumping motion. The Canada rat is distinguished by a pouch on each side of its mouth for the reception and preservation of food. The opossum is an animal about as large as a cat, remarkable for the mode of producing and rearing its young. At their birth they are extremely small, and remain concealed in a pouch under the belly, attached to the teats, as if they were inanimate. When somewhat grown, they appear occasionally at the opening of the pouch; and after they are able to run about they retreat to it in time of danger, and are protected or carried off by the mother. The opossum is remarkable for its tenacity of life: its flesh is very palatable. There are four species of the deer, differing in several particulars from the European. They are found in great numbers in those parts of the country which are still covered with wood. The elk and the moose are large animals, resembling the deer in many points; but distinguished by their superior strength and greater weight.

163. The most valuable domestic animals, the horse, the ox, the ass, the sheep, the dog, are not natives of the new continent; but they have been introduced from Europe, and are now found in all parts of the continent. Immense herds of wild horses traverse the plains west of the Mississippi; and the wild cattle of South America are hunted merely for the hides. A peculiar species of sheep, differing from the domestic animal, is found among the Chippewan mountains. The goat is seen in large herds on the plains of the Missouri.

164. The plains west of the Mississippi also abound with herds of the bison, or American wild ox, whose flesh and skin form the principal support of the Indian tribes. The bison were formerly abundant even on the sea-coast of North America; but have constantly retired as the population advanced, and are now only found beyond the Ohio and Mississippi. Thousands are sometimes seen feeding together. The musk-ox is found in the higher latitudes of this continent. Of the amphibious animals, the seal is found upon the north-west coast, and the sea-elephant in the seas on the north and east. On the coast of Mexico is the manati, or sea-cow, whose flesh resembles that of the ox. The beaver is found through the whole breadth of the continent; and exhibits the most surprising ingenuity and sagacity in the construction of its cabin and provision for its support and safety.

165. The following table will show the fallacy of the opinion, that the animals of the new continent are inferior to those of the old. The first column exhibits the weight of several species of quadrupeds in Europe, as given by Buffon; and the second shows the weight of the same animal in Vermont, as given by Dr. Williams, whose authority is unquestionable.

Animals.	In Europe.	In Vermont.
	lbs. oz.	lbs. oz.
The Bear	153 7	456 0
Wolf . . .	69 8	92 0
Deer . . .	288 8	308 0
Fox (Red) . .	13 3	20 0
Porcupine . .	2 2	16 0
Marten . . .	1 9	5 4
Pole-cat . . .	3 3	7 8
Rabbit . . .	3 4	7 0
Weasel . . .	2 2	0 12
Ermine . . .	8 2	0 14
Flying Squirrel	2 2	0 10
Beaver . . .	18 5	3 6
Otter . . .	8 9	2 8

166. The birds of North America present every variety of beautiful plumage and exquisite colours, and every form and size, from the soaring powerful eagle and the screaming vulture to the gaudy paroquet, and the exquisite miniature of the kind—the humming bird. Some have a fine note; and the mocking-bird is remarkable for its imitation of every species of song. The game and wild fowl are abundant, including pheasants, snipes, wild geese and wild ducks of several kinds, and the wild turkey, which is esteemed the greatest luxury of the kind. The reptiles are less numerous. The rattle-snake is distinguished for its habit of giving previous notice of its attacks; and this circumstance, with the slowness of its movements, renders it far less dangerous than is generally imagined. The scorpion is found in the hot countries near the tropics. America is celebrated for the number of its venomous insects, which are indeed a serious evil in the marshy, and especially the hot districts. The sea-coast is amply supplied with fish; and the banks of Newfoundland are the storehouse of cod fish for all Europe. The lakes and rivers abound with many peculiar species of great delicacy.

167. MINERALS.—North America embraces every species of geological formation, and therefore we may expect it to contain almost every variety of useful and beautiful minerals. It is well known that Mexico furnishes two-thirds of the whole amount of silver annually extracted from the globe. Gold is also found in Mexico and the United States in considerable abundance; copper and lead are abundant; and North America is proverbially a land of wood and iron, the first necessary to convert the last to useful purposes. Tin and mercury are found in Mexico, and zinc in many parts of the continent. The demand has not yet led to sufficient care in searching for the other less important metals.

168. The secondary region, which occupies the central portion of the continent, and the more limited districts of the same character on the coast, abound with coal, salt, and lime—those articles of prime necessity which could not without difficulty be imported from abroad into the interior. Nitre is also produced in sufficient quantities to supply the continent with the means of defence in the natural caves of Kentucky, Tennessee, and Virginia. Gypsum, which has become an important aid to agriculture, is also abundant. Building stone of every description is found in great abundance in most parts of the continent; and there are stores of beautiful marbles for ornamental purposes. There are also materials of the first quality for the manufacture of every species of earthen-ware and glass. The particular description of the mines of various kinds is reserved for the individual countries, as they form so important a part of their resources.

169. The alluvial regions of North America also present us with a great variety of interesting objects in the form of organic remains. Whole forests are found buried in beds of rock and strata of sand on the Atlantic. The remnants of marine and land animals are also found in great abundance; and the bones of the mastodon, found in various parts of the United States, have furnished the learned with an interesting object of admiration and research. This portion of the continent is also well supplied with mineral springs. Those of pure salt are very numerous in the secondary region. Those of sulphur also abound. Others of various qualities, saline, sulphureous, chalybeate, and carbonated, were known to the natives to have been discovered by travellers in different directions. We have the best account of those in the United States, which contain numerous and valuable mineral springs of various qualities. The whole secondary region belonging to the basin of the Mississippi, abounds in sulphureous and saline springs, which have not been fully examined or described; and in almost every state, some are found which are valued for their medicinal properties.

170. In the Atlantic States, the most noted sulphureous springs are those of Bedford and York in Pennsylvania; Ontario county and Ballston in New York; Stafford in Connecticut; Pacolet springs in South Carolina; and those of the Allegany Ridge in Virginia. On the Arkansaw River there are warm springs, said to have a temperature of 180 to 190 degrees. They have long been resorted to by the Indians for the cure of diseases. Buncombe county, in North Carolina, also contains warm springs, which are much visited. In Virginia are the Warm and Hot Springs of the county of Bath. The Warm Spring issues with a very bold stream, sufficient to turn a mill, and keeps the water in its basin thirty feet in diameter, at the vital warmth of ninety-six degrees. The Hot Spring, about six miles distant, has a temperature of 106 to 108 degrees of Fahrenheit. In the adjoining county of Monroe are the sweet springs, which rise at the foot of a large mountain; they are usually considered as more medicinal than any others in Virginia, especially for drinking; and are very copious, so that a saw-mill can be turned by them at the distance of 200 yards from their source. The taste is slightly acid; and hence they were absurdly called sweet. The temperature is 72 degrees of Fahrenheit. At New Lebanon, twenty-nine miles south-east of Albany, is a warm spring which has a moderate degree of heat. The mineral impregnation is very slight, but it has frequently proved a valuable remedy for diseases. Chalybeate springs are so numerous in all parts of the United States, that a particular description is impracticable. The most celebrated in the northern states are those of Ballston and Saratoga in New York; Schooley's Mountain in New Jersey; Stafford in Connecticut; and the red springs, near the sweet springs of Virginia. A spring recently discovered at Orange, near Newark in New Jersey, has begun to be a place of resort from the city of New York. All these springs, except those of Ballston and Saratoga, are simple chalybeates, with very little carbonic acid gas. Ballston and Saratoga are remarkable for the number and variety of their mineral springs, which are probably not surpassed in efficacy by any in the world. Their waters are bottled, and exported to distant states, and even to Europe, in considerable quantities.

171. Ballston is chiefly distinguished for its chalybeate springs, highly impregnated, and

sparkling with carbonic acid gas. Besides these, it has a saline and sulphureous spring, which are of less value. Saratoga is particularly celebrated for its saline springs, of a purgative quality, also impregnated with carbonic acid gas. The Congress spring is the principal; but there are several others of a similar kind. There are also several chalybeate springs, little inferior to those of Ballston in pleasantness or efficacy. The Olympian springs, in Kentucky, have a similar variety of waters in the space of half a mile. A remarkably fine spring of aerated water was found at the foot of James's Peak, among the rocky mountains, by the party of Major Long.

172. Springs of petroleum are found in the United States, near Green River, Kentucky; in the western parts of Pennsylvania; in Ohio, and in other places throughout the secondary region. It is often in connection with salt. At Oil Creek, Pennsylvania, and at Seneca Lake, New York, it is found floating on the surface of springs in considerable quantities. There are several places in which inflammable air or vapour issues from the ground, which are usually termed springs: one of these is found in Virginia; another is in Canada, near the Niagara river; but these appear to be merely objects of curiosity.

173. OBJECTS OF CURIOSITY.—CATARACTS.—The numerous rivers of North America, and its varied surface, of course give rise to many fine cataracts. The most celebrated is, the Falls of Niagara, in the river of the same name, which surpasses all others of the known world in grandeur. The whole mass of water, which forms the great inland seas of America, is here compressed into a channel of three quarters of a mile in width, and plunges over a precipice of 150 to 160 feet in height, into an abyss whose depth has never been fathomed.

174. The river is divided by Grand and Navy Islands, more than a mile above the grand falls, and from this place has a gradual descent of fifty-seven feet. The banks preserve the level of the country, and rise in some parts 100 feet from the water. The rapidity of the current is such that the whole stream is covered with waves, and foams like the sea in a storm. At the grand falls the river is three-fourths of a mile broad, and the precipice winds nearly in a semicircle, extending in the longest line, on the American or eastern side. The falls are divided by Goat Island into two principal portions; the American Fall on the east, and the Horse-shoe Fall on the west, or Canada side. A portion of the fall on the American side is cut off by a small island on the precipice, and forms a narrow sheet between this and Goat Island. The rest descends in one body, from a precipice 164 feet in height, and 1000 feet in length. The water is more shallow than in the other fall, and descends almost perpendicularly. Both the falls on the American side are crossed by bridges. The Horse-shoe Fall is 14 feet less in height, but far superior in grandeur. The great body of the water passes over this fall, and with such force that it forms a curved sheet, and strikes the stream below at the distance of 60 feet from the base of the precipice. The island and stream are frequently in a state which permits visitors to pass behind the sheet of water; but there is much danger of injury from the fall of rocks, which occasionally break off from the precipice. The best view of the falls is from Table Rock, a projecting mass of rock on the Canada bank in front of the Horse-shoe Fall.

The concussion of the waters produces a shock and roar which has been described as a 'thunder which fills the heaven and shakes the earth.' The clouds of spray which rise from the bottom, and conceal the source of this tumultuous roar from the spectator, ascend to the height of 100 feet above the precipice, and float away in varied shapes to a considerable distance. They are frequently illuminated with a rainbow. Sometimes three are visible in different parts of the cloud, and crown the sublimity of the scene with their dazzling splendour. The whole river seems to be in a foam, and for some distance is agitated with a deep tremour, or vibration, like the heaving produced by the shocks of an earthquake. The emotions inspired by such a scene are beyond description. The mind is overwhelmed with a sense of the weakness and littleness of man, and the awful power of the Creator. In describing this wonderful cataract, the most sublime features of all the others are depicted. The foam, the roar, the clouds of vapour, and usually the rainbow, attend most cataracts in a greater or less degree: and a minute account of others would involve the repetition of similar circumstances, less grand and interesting in their character.

175. The River Montmorenci forms a cataract 220 feet in height, nine miles below Quebec, which is in full view from the St. Lawrence. The body of water is small, and the breadth only 50 feet; but the height is great. The waters appear like snow-white foam, enveloped in a cloud of vapour, and the whole effect is grand. The falls of the River Chaudiere, which are not far distant, are about 100 feet in height, and are surrounded with interesting scenery.

176. The Mississippi forms a cataract, 40 feet in height, above its junction with the Ohio, which is more conspicuous for beauty than grandeur. The stream is 700 feet in width; the country around is level and fertile, and there are no precipices to interrupt the view.

177. The Missouri, at the distance of 500 miles from its source, descends 360 feet in eighteen miles, generally in a series of rapids. There are three principal cataracts; the highest eighty-seven feet; the second forty-seven; and the third twenty-six feet in height. The river is 1000 feet broad; and the whole scene is said to be surpassed by no other of the kind except Niagara.

178. The falls of the Passaick, a small river in New Jersey, are among the most celebrated in the United States. They are situated in Patterson, about fifteen miles from Newark. The river is 120 feet broad, and falls in one entire sheet into a chasm seventy feet in depth, and twelve wide. Its waters form the moving power for the most considerable group of manufactories in the United States.

179. The Mohawk River, near its junction with the Hudson, forms the falls termed the Cohoes, about sixty feet in height. In the Housatonic River, in the north-western corner

of Connecticut, is a cataract of the same height, which is the finest in New England. When the river is high, it is said to surpass the Cohoes in grandeur. The small streams of the United States abound in cataracts and cascades too numerous to mention. In the mountainous districts of South Carolina, there are several of considerable height and beauty. The Catawba River, in one part of its course, is precipitated in several falls through a rocky channel, to the depth of 100 feet.

180. In Georgia there is an interesting cataract in the Tockoa Creek, which flows from the Cunawhee Mountain, the southern termination of the Allegany Ridge. It passes through a channel twenty feet wide, over a precipice 187 feet high. In a wet season it descends in one sheet; but in ordinary periods the waters are separated into a fine rain, or spray, before they reach the bottom. A similar cataract occurs in the small river Ache, in Bavaria: it falls over an elevation of 200 feet by five steps, and is entirely scattered in spray: its noise is heard several miles; and the current of air is so strong as to drive back the visitor from the gulf.

181. The Connecticut River has several falls or rapids, of which the most remarkable is Bellows Falls, near Walpole. The river, when low, is compressed into a rocky passage sixteen feet in width, and rushes down with immense force, and a tumultuous roar. The whole scene is grand and striking. There is a similar rapid in the Hudson River, at Glen's Falls.

182. Caves.—The secondary formation of the United States abounds in caverns, which are most frequent in limestone rocks. In these instances, the water trickling through the roof dissolves a portion of the lime, and again deposits it when dropping. It thus gradually forms a slender tube, or stalactite of pure and brilliant whiteness. In the progress of time these stalactites are lengthened into large pillars hanging from the roof. The water which falls on the floor of these caverns makes a similar deposit, and forms a pedestal, or stalagmite, which often unites with a stalactite, and completes a column. These columns are, in many of the caverns, enlarged to a great size, varied in their shape, and sometimes beautifully fluted. In some cases the parts are imperfect. A stalagmite rising from the floor seems like an altar, or a statue; or a number of stalactites depending from the roof are united into a curtain. In this way the most interesting and fantastic forms are produced; and one of these cavities often resembles an immense cathedral lined with columns, or a magnificent palace in ruins.

183. The deposit or spa, which forms the stalactites and stalagmites, is capable of being polished and wrought into the most beautiful ornaments. The most interesting cavern of this kind is, Madison's Cavern, Rockingham county, in Virginia. Its extent is 300 feet, and its incrustations assume the various and beautiful forms we have mentioned. To describe its several divisions, and their peculiar features, would occupy space, which, in so brief an account of a great continent, is devoted to more important subjects.

184. Wier's Cave, in the same county, is of the same kind, extending 800 yards, but extremely irregular in its course and size. It does not appear to fall short of any in the United States, in the beauties peculiar to such caverns. Near the north mountain in Frederick county, Virginia, is another cave 400 feet in extent. On the banks of the Swetara River, a branch of the Susquehannah, in Pennsylvania, and in Clarendon, Dorset, and Derby in Vermont, Watertown, New York, and many other places in the United States, are similar caves. At Rhinebec, Duchess county, New York, is a cave of this kind, composed of two chambers, one above the other.

185. Another class of caves includes such as produce nitre and salts of different kinds. Near Corydon, Indiana, is a large cave which has been explored for the distance of several miles, celebrated for producing Epsom salts, which is continually forming in the earth on the bottom. In Kentucky and Tennessee, caves are numerous, which appear to have been used as burial-places. The earth found in them is often so impregnated with nitre, that great quantities of this article are manufactured from it. Some in Kentucky are said to be several miles in length, containing rooms of immense size, and frequently adorned with stalactites.

186. In the north-west part of Georgia is a cave of this kind called Nickojack Cave, fifty feet high, and 100 wide, which has been explored to the distance of three miles. A stream of considerable size runs through it, which is broken by a waterfall at this distance from the mouth. In the Allegany Ridge, in Virginia, is a blowing cave, from which wind constantly issues. It is 100 feet in diameter, and the current of air is so strong as to keep the weeds prostrate to the distance of sixty feet from its mouth. A similar one is found in the Cumberland Mountains. We have no account so particular as to enable us to describe objects of curiosity of this kind in other parts of the continent.

187. The natural bridge of Virginia is among the most interesting objects of curiosity of North America. It passes over Cedar Creek, in Rockbridge, with a lofty arch of solid rock sixty-five feet wide, and covered with a sufficient depth of earth to support a number of large trees. The chasm is from sixty to eighty feet in width; and the arch springs from perpendicular rocky abutments to the height of 210 feet above this stream. The bridge is bordered by a parapet of rocks, and the traveller might pass without being aware of his situation. Few have sufficient resolution, on perceiving the height, to walk to the edge. The passenger involuntarily falls on his hands and creeps to the parapet; and probably no one can look down without a degree of shuddering as well as astonishment. The view from below is as delightful as that from above is painful. The arch seems springing to the clouds; no scene of nature can produce higher emotions of the sublime. A similar bridge in Scott county, in Virginia, is 1000 feet long, but has attracted less attention.

188. Political Divisions.—Previous to the discovery of America in 1492, it was exclusively

inhabited and possessed by the various tribes of Indians. As discoveries were made, and settlements established, each European nation claimed possession of the portions respectively seen, or occupied by their subjects, usually without any regard to the rights of the natives, or any compensation for their lands. In this way, the French laid claim to the Canadian provinces, and the English to the country south of the St. Lawrence, as far as Florida. The French were ultimately expelled from Canada, and the whole continent north of latitude 30° except Louisiana, was under their control. Disputes with the colonies south of Canada led to their declaration of independence in 1776, and the foundation of the United States, the first independent government of whites. On the new continent, Spain laid claim to the peninsula of Mexico and Florida by right of discovery and conquest; and to the extensive region of Louisiana, lying between the United and the Pacific Ocean. The purchase of Louisiana and Florida by the United States, extended the dominions of that government to the Pacific; and the continent is thus divided into three great portions: the British possessions, occupying the northern portion; the United States, the middle; and the late colony of Mexico, now an independent federal republic, the southern and peninsular part. The southern provinces of Mexico have recently separated themselves, and formed an independent government; and the Russians claim a small division of the north-west coast, thus adding two subdivisions, but of little importance in point of extent.

189. The two great lines of division have been carefully settled by treaties. The boundary between the United States and the British possessions, commences on the Atlantic coast at the mouth of the river St. Croix, and proceeds to its source. 2. Thence north to the highlands, dividing the water of the St. Lawrence, and the Atlantic, and along those highlands to the 45th degree of latitude. 3. Thence by a line due west to the St. Lawrence, and up that river, and through the centre of the great lakes to the long lake, and lake of the woods. 4. Thence to the 49th degree of latitude, and along that parallel to the Rocky Mountains. Beyond these mountains the boundary is left unsettled.

190. The southern boundary of the United States, dividing them from Mexico, commences at the mouth of the Sabine River, proceeds along its western bank to the 32nd degree of latitude. 2. Thence it proceeds due north to the Red River, and along that river to the 100th degree of longitude west from London. 3. Thence due north to the Arkansaw River, and along that river to its source. 4. And thence to the 42nd degree of latitude, and along that parallel to the Pacific Ocean. The bounding streams in both instances are common to the respective nations, for the purpose of navigation.

191. The actual divisions, as in many other cases of the kind, do not correspond to the nominal. If the continent be divided by a line drawn northward from the mouth of the Mississippi, the whole western portion north of 30°. of latitude, and the whole eastern portion north of 50°. forming three quarters of the continent, are occupied and governed almost exclusively by the Indians, and a large part of it has scarcely been visited by a white man. A few trading houses here and there are the only emblems of the power of the whites, west of the Mississippi, and north of Canada; and they are in effect only in possession of one-fourth part of the territories they claim unitedly.

192. The proportion of population is very different. The territories occupied by civilized inhabitants, contain at least eighteen millions of inhabitants; while the Indians cannot be supposed to exceed two millions, and probably fall short of this number.

The relative population of each division is as follows:—

Mexico,	1808,	...	6,600,000
United States,	1820,	...	9,638,000
British Possessions		...	828,000
Unsubdued Indians		...	2,000,000
			19,066,000
Supposed increase of United States in five years		..	1,600,000
Total population,		....	20,666,000

This population is thus arranged as to their races.

WHITES.		
Mexico	1,200,000	
United States, 1820, .	7,860,000	
Add ⅛ for increase ..	1,310,000	
British Possessions .	828,000	
		11,198,000
INDIANS AND MIXED RACES.		
Mexico, 1808,		
Subdued Indians, .	2,500,000	
Mixed race, ...	1,231,000	
United States, ...	500,000	
Other parts, ...	1,500,000	
	5,731,000	
Increase, ...	1,000,000	
		6,731,000
AFRICANS.		
Mexico	8,000	
United States		
Slaves	1,538,000	
Free	234,000	
Add for increase	300,000	
		2,080,000
Total		20,009,000

UNITED STATES OF NORTH AMERICA.

CHAP. II.

193. The United States form a single republic, composed of twenty-four separate states and several territorial governments, together with an extensive territory acquired by purchase, west of the Mississippi River, which is yet undivided, and scarcely explored. The whole covers a surface of two millions of square miles: about one million are occupied by 9,600,000 civilized inhabitants; and the remainder by 400,000 or 500,000 Indians, in a savage state. The mean length from east to west is 2500 miles; and the mean breadth from north to south 830. It extends from latitude 24°. 20′. to 49°. and lies between 66°. 49′. and 125°. west longitude from London, extending through every climate, and presenting every variety of soil and exposure, and nearly all the species of productions and animals found in North America. Its eastern boundary is the Atlantic Ocean; on the north it is separated from the neighbouring British possessions by the great chain of lakes; on the south it extends to the Gulf of Mexico; and on the south-west and west, its inhabited portions are protected from invasion by an extensive barren region and lofty mountains, while its territory stretches to the Pacific.

194. If we attend only to the inhabited portion, which extends from the ocean inland to a line drawn from Lake Erie along the Wabash and the Mississippi, the included region has an irregular conical form about 1700 miles in length from Maine to Louisiana. This region is divided into two parts nearly equal, by the Apalachian chain, the maritime states lying on the Atlantic declivity of these mountains, and the western states on the opposite side. Several of the maritime states, however, have this boundary, and form, as it were, connecting links between these portions, whose interests at first sight seem to be opposed. This vast country, though it contains ten millions of inhabitants, is yet so thinly peopled that it appears to an European eye like one vast forest. In the region west of the mountains, a vast extent remains entirely in its natural state; and in the most populous parts the wood is preserved for fuel so as to cover nearly half the country. We have already described the great features of this country—its mountains, geological structure, surface, and waters. It only remains to describe its political conditions, its principal resources, and the state of population and improvement. The United States are usually divided into four great sections: 1. The eastern or New England states, lying east of the Hudson River and Lake Champlain. 2. The four middle states lying on the Atlantic waters between the Hudson River and Maryland. 3. The six southern states, lying south of Pennsylvania on the sea-coast; and 4. The eight western states, lying west of the mountains, and on the waters of the Mississippi. By the northern states are generally intended the eastern and middle states, distinguished from the southern and slave-holding states.

195. Population.—A census of the United States is taken every ten years.

The following table will show the whole population of the United States at the last census in 1820, its distribution among the different states, the increase of each state, and the relative increase of whites and slaves.

196. It will be seen that a large and unhappy part of the population of the southern and south-western states consists of slaves, and that they are increasing with alarming rapidity. It is now deemed even by the slave-holders themselves, to be important to provide some asylum for them out of the country, and thus render their gradual emancipation safe. A colony has been commenced with this view at Cape Misurado, on the coast of Africa. The northern states, it will be observed, are in a great measure free from this curse. Indeed it was originally entailed upon the colonists by the avarice of merchants at home, notwithstanding several strong remonstrances and urgent petitions from the provincial legislatures; and should rather be pitied as a misfortune, than charged as a fault on the present proprietors, provided that they take the earliest means which safety permits to emancipate them. It should be remembered, that a question of this magnitude cannot be correctly decided, but by one intimately acquainted with the condition of the slaves and the situation of the country. It is happily now understood, that slave-labour is less profitable than that of freemen; and it is hoped the evil may thus furnish its own cure.

TABLE I.

197. Of the Population of the United States, arranged in Classes; from the Census of 1820.

Free White Citizens.	Males.	Females.	
Under 10 years . . .	1,347,342	1,282,468	
From 10 to 16 . . .	613,390	606,152	
From 16 to 26 . . .	777,458	782,415	
From 26 to 45 . . .	767,220	737,383	
Over 45	495,554	463,122	
Total . . .	4,000,964	3,871,540	7,872,504
		Carried forward .	7,872,504

	Brought forward . . .		7,872,504
Free Coloured Persons.	**Males.**	**Females.**	
Under 14 years . . .	47,676	45,912	
From 14 to 26 . . .	24,058	28,804	
From 26 to 45 . . .	23,456	27,183	
Over 45	17,619	18,884	
Total . . .	112,809	120,783	233,592
Slaves.	**Males.**	**Females.**	
Under 14 years . . .	345,108	325,526	
From 14 to 26 . . .	203,963	203,228	
From 26 to 45 . . .	164,356	153,167	
Over 45	77,538	70,802	
Total . . .	790,965	752,723	1,543,688
All other persons except Indians not taxed			4,631
Total, exclusive of foreigners not naturalized . . .			9,654,415
Foreigners not naturalized			53,720
Total Population of the United States, according to the Census of 1820			9,708,135

TABLE II.

Of the Free White Population, of the Free Persons of Colour, and of the Slaves, in 1820.

	States.	Free White Persons.	Free Coloured Persons.	Slaves.	Total.	Population to a square Mile.
Eastern States.	Maine	297,340	929		298,335	9
	New Hampshire . .	243,236	786		244,161	26
	Massachusetts . .	516,419	6,740		523,287	72
	Rhode Island . . .	79,413	3,554	48	83,059	61
	Connecticut	267,181	7,870	97	275,248	58
	Vermont	234,846	903		235,764	23
Middle States.	New York	1,332,744	29,279	10,088	1,372,812	30
	New Jersey	257,409	12,460	7,557	277,575	34
	Pennsylvania . . .	1,017,094	30,202	211	1,049,458	24
	Delaware	55,282	12,958	4,509	72,749	34
Southern States.	Maryland	260,222	39,730	107,398	407,350	29
	Virginia	603,074	36,889	425,153	1,065,366	17
	North Carolina . . .	419,200	14,612	205,017	638,829	13
	South Carolina . . .	237,440	6,826	258,475	502,741	18
	Georgia	189,566	1,763	149,656	340,989	6
	Alabama	96,245	633	47,439	144,317	3
Western States.	Mississippi	42,176	458	32,814	75,448	2
	Louisiana	73,383	10,476	69,064	153,407	3
	Tennessee	339,727	2,729	80,097	422,613	10
	Kentucky	434,644	2,759	126,732	564,317	13
	Ohio	576,572	4,723		581,434	15
	Indiana	145,758	1,230	190	147,178	4
	Illinois	53,788	457	917	55,211	1
	Missouri	53,788	347	10,222	66,586	1
	Michigan Territories . .	8,591	174		8,896	
	Arkansaw Territories . .	12,552	59	1,617	14,273	
	District of Columbia . .	22,614	4,048	6,377	33,039	
	Total	7,852,504	233,592	1,543,688	9,654,415	

TABLE III.

Of States in the order of Population in 1820, with the Population in 1800 and 1810, and the Rate of Increase.

States.	1800.	1810.	1820.	Increase 1810—20.	Increase per cent.
New York	586,050	959,049	1,372,812	413,763	43
Virginia	886,149	974,622	1,065,366	90,744	9
Pennsylvania	602,548	810,091	1,049,458	239,367	30
North Carolina	478,103	555,500	638,829	83,329	11
Ohio	45,365	230,760	581,434	350,674	150
Kentucky	220,959	406,511	564,317	157,806	39
Massachusetts	422,845	472,040	523,287	51,247	11
South Carolina	345,591	415,115	502,741	87,637	18
Tennessee	105,602	261,727	422,613	160,896	161
Maryland	349,692	380,546	407,350	26,804	7
Georgia	162,686	252,433	340,989	88,556	35
Maine	151,719	228,705	298,335	69,630	30
New Jersey	211,149	245,562	277,575	32,013	13
Connecticut	251,002	261,942	275,248	13,306	5
New Hampshire	183,858	214,460	244,161	29,701	13
Vermont	154,465	217,895	235,764	17,869	8
Louisiana	—	76,556	153,407	76,851	100
Indiana	—	24,520	147,178	122,658	500
Alabama	8,850	31,502	144,317	179,413	540
Mississippi			75,448		
Rhode Island	69,152	76,931	83,059	6,128	8
Delaware	64,273	19,783	72,749	75	—
Missouri	—	20,845	66,586	45,741	230
Illinois	—	12,282	55,211	42,929	350
District of Columbia	14,093	24,023	33,039	9,016	37
United States and Territories	5,319,762	7,239,903	9,654,415	2,414,512	33

TABLE IV.

Of the Increase of Slaves and Free Persons, and the Number of Slaves to 1000 Free Persons in each State.

States.	Increase of Free Persons per cent.	Increase of Slaves per cent.	Number of Slaves to 1000 Free Persons.		
			In 1800.	In 1810.	In 1820.
Maine	30	*	—	—	—
New Hampshire	13	*	—	—	—
Vermont	8	*	—	—	—
Massachusetts	10	*	—	—	—
Connecticut	5	†	3	1	—
Rhode Island	8	†	5	1	—
New York	44	†	36	15	7
Pennsylvania	29	†	2	—	—
New Jersey	15	†	62	46	27
Delaware	. . . .	8	105	60	66
Maryland	11	†	445	451	358
Virginia	9	8	643	674	664
North Carolina	12	20	386	436	472
South Carolina	9	18	732	897	1055
Georgia	29	42	579	714	782
Alabama	. . . .	—	—	—	453
Mississippi	. . . .	—	—	—	769
Louisiana	100	100	—	827	818
Tennessee	50	80	147	205	233
Kentucky	33	57	223	246	266
Ohio	150	—	—	—	—
Indiana	. . . .	—	—	—	1
Illinois	. . . .	—	—	—	16
Missouri	. . . .	—	—	—	181

* These States have no Slaves. † In these they diminish.

TABLE V.

198. The following Table exhibits the Classification of the productive Inhabitants of each State, the Number of Persons engaged in Agriculture, Commerce, and Manufactures, in each of the United States; together with the proportion which each Class forms of the whole Population.

States.	Persons engaged in					
	Agriculture.		Commerce.		Manufactures.	
	Number.	Proportion.	Number.	Proportion.	Number.	Proportion.
Maine	55,031	18.5	4,297	1.5	7,643	2.5
New Hampshire	52,384	21.4	1,068	.4	8,699	3.5
Massachusetts	63,460	12.1	13,301	2.5	33,464	6.4
Rhode Island	12,559	15.1	1,162	1.4	6,091	7.3
Connecticut	50,518	18.4	3,581	1.3	17,541	6.4
Vermont	50,951	21.6	776	.3	8,484	3.6
New York	247,648	18.0	9,113	.66	60,038	4.3
New Jersey	40,812	14.4	1,830	.66	15,941	5.7
Pennsylvania	140,801	13.4	7,083	.67	60,215	5.7
Delaware	13,259	18.2	533	.73	2,821	4.0
Maryland	79,135	19.4	4,771	1.2	18,640	4.5
Virginia	276,422	25.9	4,509	.4	32,336	3.0
North Carolina	174,196	27.3	2,551	.4	11,844	1.8
South Carolina	161,560	32.9	2,588	.5	6,488	1.3
Georgia	101,185	29.6	2,139	.6	3,557	1.0
Alabama	30,642	24.0	452	.3	1,412	1.1
Mississippi	22,033	29.2	294	.4	650	.9
Louisiana	53,941	35.1	6,251	4.1	6,041	4.0
Tennessee	101,919	24.1	882	.2	7,860	1.8
Kentucky	132,161	23.4	1,617	.3	11,779	2.0
Ohio	110,991	19.0	1,459	.2	18,956	3.3
Indiana	31,074	21.1	429	.3	3,229	2.2
Illinois	12,395	22.5	233	.4	1,007	1.8
Missouri	14,247	21.4	495	.8	1,952	3.0
Michigan Territory	1,468	16.6	392	4.4	196	2.0
Arkansaw Territory	3,613	25.4	79	.5	179	1.2
District of Columbia	853	2.6	512	1.6	2,184	6.6
Total	2,065,399	21.4	72,397	.75	349,247	3.5

199. The following Table shows the Increase of Population in the whole United States since 1790. It is generally at the rate of 3 per cent. per annum.

Year.	Population.	
1790	3,929,326	
1800	5,306,035	Increase in 30 years . 5,725,089
1810	7,239,903	
1820	9,654,415	

200. GOVERNMENT.—The powers of the federal government are legislative, executive, and judiciary: I. The legislative power is vested in a congress of the United States, consisting of a senate and a house of representatives.

201. The members of the house of representatives are chosen every second year by the people of the several states; and the electors in each state must have the qualifications requisite for the electors of the most numerous branch of the state legislature. A representative must be twenty-five years of age, and have been seven years a citizen of the United States; and be an inhabitant of that state for which he shall be chosen. The representatives are at present chosen in the several states in the proportion of one for every 40,000, in which enumeration the Indians and two-fifths of the people of colour are not included.

202. The senate is composed of two members from each state, chosen for six years by the respective state legislatures; and the seats of one-third are vacated every two years. A senator must be thirty years of age, and have been nine years a citizen of the United States, and at the time of his election an inhabitant of the state for which he is chosen. The vice-president of the United States is likewise president of the senate; but has no vote unless they are equally divided.

203. Congress must assemble at least once every year. The meetings shall be on the first Monday in December, unless a different day shall be appointed by law. No law can be passed without the concurrence of both houses. When that is obtained, it is presented to the president, who, if he approves, signs it; if not, he returns it, with his objections, for the re-consideration of congress, and it cannot in that case become a law without the concurrence of two-thirds of the members. The president must return it within ten days, otherwise it becomes a law without his approbation.

204. The congress have power—1. To lay and collect taxes, duties, imposts, and excises, to pay the debts, and provide for the common defence and general welfare of the United States; but all duties, imposts, and excises, shall be uniform throughout the United States. 2. To borrow money on the credit of the United States. 3. To regulate commerce with foreign nations, and among the several states, and with the Indian tribes. 4. To establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies, throughout the United States. 5. To coin money; to regulate the value thereof, and of foreign coin; and fix the standard of weights and measures 6. To provide for the punishment of counterfeiting the securities and current coin of the United States. 7. To establish post-offices and post-roads. 8. To promote the progress of science and useful arts, by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries. 9. To constitute tribunals inferior to the supreme court. 10. To define and punish piracies and felonies committed on the high seas, and offences against the law of nations. 11. To declare war; grant letters of marque and reprisal; and make rules concerning captures on land and water. 12. To raise and support armies. But no appropriation of money for that use shall be for a longer term than two years. 13. To provide and maintain a navy. 14. To make rules for the government and regulation of the land and naval forces. 15. To provide for calling forth the militia to execute the laws of the union, suppress insurrections, and repel invasions. 16. To provide for organizing, arming, and disciplining the militia, and for governing such part of them as may be employed in the service of the United States; reserving to the states respectively the appointment of the officers, and the authority of training the militia according to the discipline prescribed by congress. 17. To exercise exclusive legislation, in all cases whatsoever, over such district (not exceeding ten miles square) as may, by cession of particular states, and the acceptance of congress, become the seat of government of the United States; and to exercise like authority over all places purchased by the consent of the legislature of the state in which the same shall be, for the erection of forts, magazines, arsenals, dock-yards, and other needful buildings; and 18. To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this constitution in the government of the United States, or any department or officer thereof.

205. II.—The executive power is vested in a president, who is elected for four years, as follows: Each state appoints, in such a manner as the legislature may direct, a number of electors equal to the whole number of senators and representatives which that state sends to congress. But no senator or representative, or person holding any office of trust or profit under the United States, can be an elector. The electors meet in their respective states, and vote by ballot for president and vice-president, one of whom, at least, shall not be an inhabitant of the same state with themselves. The list of the votes are sent to the seat of government, directed to the president of the senate; who, in presence of the senate and house of representatives, opens the certificates, and the votes are counted. The person having the greatest number of votes for president is declared to be elected to that office, provided he have the votes of a majority of all the electors appointed. If not, then from the persons having the greatest number of votes, not exceeding three, the house of representatives choose the president by ballot. No person except a natural-born citizen, or a citizen of the United States at the time of the adoption of this constitution, shall be eligible to the office of president; and he must be thirty-five years of age, and have resided fourteen years within the United States. The president shall be commander-in-chief of the army and navy of the United States, and of the militia of the several states, when called into the actual service of the United States. He may require the opinion, in writing, of the principal officers in each of the executive departments, upon any subject relating to the duties of their respective offices; and he shall have power to grant reprieves and pardons, for offences against

the United States, except in cases of impeachment.

206. He shall have power, by and with the advice and consent of the senate, to make treaties, provided two-thirds of the senators present concur; and he shall nominate, and, by and with the advice and consent of the senate, shall appoint ambassadors, other public ministers, and consuls, judges of the supreme court, and all other officers of the United States, whose appointments are not otherwise provided for, and which shall be established by law. But the congress may, by law, vest the appointment of such inferior officers, as they think proper, in the president alone, in the courts of law, or in the heads of departments. The president shall have power to fill up all vacancies that may happen during the recess of the senate, by granting commissions, which shall expire at the end of their next session.

207. He shall, from time to time, give to the congress information of the state of the Union; and recommend to their consideration such measures as he shall judge necessary and expedient. He may, on extraordinary occasions, convene both houses, or either of them; and, in case of disagreement between them, with respect to the time of adjournment, he may adjourn them to such time as he shall think proper. He shall receive ambassadors and other public ministers. He shall take care that the laws be faithfully executed; and shall commission all the officers of the United States.

208. III.—The judiciary power of the United States is vested in a supreme court, and in such inferior courts, as the congress may, from time to time, ordain and establish. The judges, both of the supreme and inferior courts, hold their offices during good behaviour; and receive for their services a compensation, which cannot be diminished during their continuance in office.

209. The judiciary power extends to all cases, in law and equity, arising under this constitution, the laws of the United States, and treaties made, or to be made, under their authority; to all cases affecting ambassadors, other public ministers, and consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be a party, to controversies between two or more states, between a state and citizens of another state, between citizens of different states, between citizens of the same state claiming lands under grants of different states, and between a state, or the citizens thereof, and foreign states, citizens, or subjects.

210. In all cases affecting ambassadors, other public ministers, and consuls, and those in which a state shall be a party, the supreme court shall have original jurisdiction. In all the other cases before mentioned, the supreme court shall have appellate jurisdiction, both as to law and fact, with such exceptions, and under such regulations, as the congress may make.

211. The trial of all crimes, except in cases of impeachment, shall be by jury, and such trial shall be held in the state where the said crimes shall have been committed; but when not committed within any state, the trial shall be at such place or places as the congress may by law have directed.

212. The following declaratory clauses show more particularly the principles of the constitution. 1. The privilege of the writ of habeas corpus shall not be suspended, unless when, in cases of rebellion or invasion, the public safety may require it. 2. No bill of attainder or ex post facto law shall be passed. 3. No capitation or other direct tax shall be laid, unless in proportion to the census. 4. No tax or duty shall be laid on articles exported from any state. No preference shall be given, by any regulation of commerce or revenue, to the ports of one state over those of another; nor shall vessels bound to or from one state, be obliged to enter, clear, or pay duties in another. 5. No money shall be drawn from the treasury, but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time. 6. No title of nobility shall be granted by the United States; and no person, holding any office of profit or trust under them, shall, without the consent of congress, accept of any present, emolument, office, or title, of any kind whatever, from any king, prince, or foreign state. 7. No state shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make any thing but gold and silver coin a tender in payment of debts; pass any bill of attainder, ex post facto law, or law impairing the obligation of contracts, or grant any title of nobility. 8. No state shall, without consent of congress, lay any tax or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts laid by any state on imports or exports, shall be for the use of the treasury of the United States; and all such laws shall be subject to the revision and control of congress. No state shall, without the consent of congress, lay any duty on tonnage, keep troops or ships of war in time of peace, enter into any agreement or compact with another state or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger as will not admit of delay. 9. Full faith and credit shall be given in each state to the public acts, records, and judicial proceedings of every other state. And the congress may, by penal laws, prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof. 10. New states may be admitted by the congress into this union; but no new state shall be formed or erected within the jurisdiction of any other state, nor any state be formed by the junction of two or more states, without the consent of the legislatures of the states concerned as well as of the congress. 11. The congress shall have power to dispose of, and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this constitution shall be so construed, as to prejudice any claims of the United States, or of any particular state. 12. The United States shall guaranty to every state

in this union a republican form of government; and shall protect each of them against invasion, and on application of the legislature, or of the executive (when the legislature cannot be convened), against domestic violence. 13. The senators and representatives before mentioned, and the members of the several state legislatures, and all executive and judicial officers, both of the United States and of the several states, shall be bound, by oath or affirmation, to support this constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States. 14. Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the rights of the people peaceably to assemble, and to petition the government for a redress of grievances. 15. A well-regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed. 16. No soldier shall in time of peace be quartered in any house, without the consent of the owner; nor in time of war, but in a manner to be prescribed by law. 17. The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated; and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized. 18. No person shall be held answerable for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger: nor shall any person be subject, for the same offence, to be twice put in jeopardy of life or limb; nor shall be compelled, in any criminal case, to be a witness against himself; nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation. 19. In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the state and district wherein the crime shall have been committed, which district shall have been previously ascertained by law; and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favour, and to have the assistance of counsel for his defence. 20. In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved; and no fact tried by a jury shall be otherwise re-examined, in any court of the United States, than according to the rules of the common law. 21. Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted. 22. The enumeration in the constitution of certain rights shall not be construed to deny or disparage others retained by the people. 23. The powers not delegated to the United States by the constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people. 24. The judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States by citizens of another state, or by citizens or subjects of any foreign state.

213. The laws of the United States are of twofold character, corresponding with the nature of the government; and are general or federal laws, and state laws. The general laws consist of the constitution of the United States, acts of congress and public treaties. The state laws consist of the state constitution, the statute law or acts of the state legislature, and the common law of each, usually founded on the common law of England.

214. Agriculture.—The United States, and its territories, were so recently settled, and fertile land has been so abundant, that there has been less inducement than in Europe, to improve the methods of tillage. It has been too common to cultivate lands in an imperfect manner, until they were worn out; and then clear up new tracts of forest, or emigrate into the unsettled and fertile country west of the Allegany mountains. The rich vegetable mould which accumulates in a forest affords for many years so rich a soil, that abundant crops are produced with very little care. Hence the agriculture is much inferior to that of England, although far superior to that of most parts of Europe. In the older states, great efforts have been made of late years, and considerable improvements effected.

215. With regard to the products of agriculture, the United States may be divided into four regions, corresponding to those of climate: the northern or grazing region—the middle or wheat region—the warm or cotton region—and the tropical region on the gulf of Mexico, producing the sugar-cane.

216. New England, and the northern parts of New York, are best adapted to grazing, from the soil and face of the country. Butter, cheese, cattle, and provisions, are the chief products, and large quantities are exported. Great numbers of sheep are raised, and a considerable quantity of wool is furnished for manufacture. New England is divided into small farms, which are generally tilled in a neat and skilful manner. Wheat was formerly cultivated; but it has become a precarious crop of late years, and rye is the principal grain now raised. Large supplies of wheat are obtained from the middle region. Maize and potatoes are among the most important vegetable products. Barley, oats, and buck-wheat, and the garden vegetables, yield abundantly. Orchards are numerous in most parts of New England; and cider is the common drink of the inhabitants. The peach is raised with difficulty; but other fruits of the temperate regions are abundant.

217. Maine, New Hampshire, and Vermont are only in a partial state of cultivation. The extensive forests furnish large quantities of timber and potash for exportation.

218. The northern part of Rhode Island is sterile; but the islands and coast of Narraganset Bay are among the most fertile and well cultivated spots in the United States, and are cele-

brated for excellent cattle, and numerous flocks of sheep.

219. Massachusetts is considered the best cultivated state in the Union, except Pennsylvania; and much advance has been made by means of agricultural societies, and the premiums offered by them. Connecticut has commenced a similar course of improvement.

220. The middle, or wheat region, comprises the southern and western parts of New York, New Jersey, Pennsylvania, the states north of the Ohio, Delaware, Maryland, Virginia, and Kentucky. In New York, New Jersey, Pennsylvania, Delaware, and the neighbouring portions of Maryland and Virginia, tillage is generally conducted with skill.

222. Pennsylvania was the first state in the Union in which agricultural societies were formed, and doubtless holds the first rank in agricultural improvements. These have been chiefly made in the south-western parts, extending to the foot of the Blue Ridge. Much of the northern and western parts is still covered with forests. In this state was first introduced the practice of manuring with clover, which has so much enriched the soil of that and all the neighbouring states. It is raised by means of plaster of Paris in luxuriant crops, and is then ploughed into the soil.

223. In Maryland and Virginia much less attention is paid to agriculture; and lands are frequently worn out and deserted for want of care. The valley of the Shenandoah, west of the Blue Ridge, is superior in tillage to the surrounding country.

224. In the western states on the Ohio the native richness of the soil is not yet exhausted; and, without the aid of an improved system of agriculture, the crops are far superior to those of the best cultivated states on the Atlantic.

225. The wheat of the middle region is the finest produced in the United States, and forms the third in importance among our exports. Maize is raised in great quantities, and rye, oats, and buck-wheat are abundant. Tobacco is extensively cultivated in Maryland, Virginia, and Kentucky, and, next to cotton, is the most valuable article of export from the United States. Hemp was formerly cultivated extensively in Kentucky, but of late it has been exchanged for tobacco, as a more profitable crop.

226. In the states on the Atlantic orchards are numerous, and great quantities of cider are made. The cider of New Jersey (especially of Newark) is much celebrated, and often rivals the Champagne wine of France in sprightliness and flavour. West of the mountains, orchards are more rare, and large quantities of grain are raised for the distillation of spirituous liquors. The peach is abundant in Virginia, Maryland, Delaware, New Jersey, Ohio, the southern parts of Pennsylvania, and the western parts of New York. Extensive orchards are cultivated in Virginia, for the manufacture of peach brandy. Pears, cherries, plums, and other fruits flourish in most parts of this region. At Vevay, on the Ohio river, vineyards have been planted by a colony of Swiss, and good wine is made.

227. In New York, Pennsylvania, and New Jersey, the grazing and fatting of cattle are important branches of agriculture; and the products of the dairy are very fine. In Virginia, and the western states, great numbers of swine are raised in the woods for provisions. Large quantities of pork are exported from the Western States; and droves of horses and cattle are sent into the Atlantic states. The winters are so mild that they usually require no shelter, and little fodder.

228. The warm or cotton region of the United States, commences in Tennessee and the southern parts of Virginia, and extends to the gulf of Mexico. In all the states lying south of Pennsylvania and the river Ohio, the land is tilled almost entirely by slaves. In consequence of this, agriculture is much more imperfect than in the northern states, where the farmer himself is usually employed in the labours of the field.

229. Cotton is the chief article of culture in this region, and yields great profit to the planter. It is raised throughout Virginia for home consumption, and has been found to flourish still farther north. Rice and maize are the principal grains of the cotton region. Maize is the principal food of the slaves in these states, and in Virginia. Rice is exported in considerable quantities. Wheat and rye are little cultivated, except in the hilly country. Barley, oats, hemp, and tobacco flourish here. Indigo has been cultivated to a great extent, especially in Georgia and South Carolina; but the profits arising from the crops of cotton now lead to the neglect of all others. The potatoe cannot be cultivated to advantage in this region; and the sweet potatoe, a plant of a different species, is generally substituted.

230. Peaches are abundant and fine. The fig and pomegranate are also raised, and the orange and lemon grow imperfectly in South Carolina. Apples, pears, and other fruits of the temperate regions degenerate.

231. The cotton is of two kinds. The black-seed or sea-island is by far the most valuable; but it can be raised only in a few districts, and chiefly on the low islands which line the coast of the southern states. The green-seed, or upland cotton, requires so much labour to separate it from the seed, that it was not worth raising until the invention of the cotton-gin. Before this time it was an article of small importance, but now it forms one-third of the exports of the United States, exceeding in value all the other products of the field and the forest.

232. The tropical region embraces Louisiana, Florida, and the southern parts of Georgia, Alabama, and the Mississippi. Sugar is here an important article of culture, and an object of increasing attention. Coffee may probably be raised; but experiment has not yet been made to any extent.

234. Maize produces luxuriant crops, almost without cultivation. But the inhabitants of the whole region lying on the Mississippi and Gulf of Mexico, south of Kentucky, depend chiefly on the states on the Ohio river for supplies of grain, and are occupied more profitably in the culture of cotton or sugar. Great numbers of cattle and swine are raised and fattened in the woods with

very little care. The orange, lemon, and fig, are found in this region in perfection; and it is not improbable, that this tract of country may supply us hereafter with sugar and coffee, and most of the important productions of the tropical regions.

235. Roads.—Probably no people ever made so many improvements in roads, bridges, and canals, over such an extent of country in the same time, as the inhabitants of the United States. Two centuries ago the whole tract was a wilderness, covered with forests, and traversed only by the foot-paths of the Indians. Now, there are roads constructed in every direction to connect the villages, towns, and cities, which have sprung up in rapid succession. In 1790 the extent of post-roads was only 1875 miles; in 1818 it was 51,600. The number of post-offices exceeds 4000; and the mail is transported 20,000 miles daily. To describe all the roads would require an enumeration of all the important settlements in the country. A large number are public roads, constructed and repaired by the towns through which they pass; but the great roads are usually turnpikes, constructed by the state or incorporated bodies, and supported by tolls. Only their general character, and the most important routes, can be described.

236. The northern primitive district of the United States, including New England and the northern part of New York, falls within the cold region; and generally has permanent snows during the winter, as far south as latitude forty-two degrees, which render travelling easy, and protect the roads from injury. New England and the greater part of the middle states are intersected in every direction by roads, which are usually well constructed, and in good repair. New York and Pennsylvania have little advantage from the snow; and the rich clayey soil, which is most prevalent, renders the roads very bad during the winter. The same is true to a greater extent in Maryland. In Pennsylvania about eight millions of dollars are invested in roads and bridges.

237. In the sandy alluvial country of the Atlantic coast, from New York to Florida, the roads are heavy, and not easily improved; but they rarely present the difficulties and dangers found in the roads of a rich country, after a wet season. The scattered state of population has prevented much attention to roads in the states south of Maryland, and frequent impediments are presented by the want of bridges and causeways over the streams and marshes.

238. In the western states, the richness of the soil, the want of stone and gravel, and the moisture of the winter, render the construction of good and permanent roads almost impracticable. During the wet season the difficulty of travelling is very great; and many roads are scarcely passable for wheel-carriages. The streams are so variable at different seasons, that most of them can be forded during the dry season, and bridges are rarely built. The banks are high and steep, and the difficulty of passage is often very great. During high water many of the streams become impassable, and the traveller encounters serious difficulties and dangers. Little has yet been done to improve roads; but in all these states, except Tennessee and Kentucky, a portion of the proceeds of public lands sold by the United States, is appropriated to them, besides the usual taxes; and we may expect a rapid improvement in this respect, when these states become thickly settled. In Louisiana, the levees on the banks of the streams form excellent roads.

239. The most important post-road of the United States, is that which traverses the states on the Atlantic, a distance of 1800 miles, passing through all the principal towns, from Robbinstown in Maine, to Florida. The principal roads from the Atlantic to the western states are—the great western turnpike of New York, from Albany to Buffalo and Erie; the road from Philadelphia, through Lancaster, to Pittsburgh; and the Cumberland road, from Washington city to Wheeling on the Ohio river. The latter was constructed at the expense of the general government, and is probably the best route over the mountains. Other roads, of less importance, cross the Allegany ridge in Virginia and North Carolina; and the state of South Carolina has recently opened a road across the mountains to Tennessee.

240. A military road has been opened by General Jackson, at the expense of the United States, from Nashville in Tennessee to Madisonville on lake Ponchartrain, opposite New Orleans, which may be travelled by wagons. A branch leads from this road to Natches, through the wilderness inhabited by the Choctaw Indians. From New Orleans the traveller may continue his journey by a road which has been opened by the inhabitants of Louisiana, across the adjoining province of Texas and the desolate plains of the Rio del Norte, to the capital of Mexico. There are few obstacles to be overcome in making it a good commercial route: the ascent of the table-land in this direction is easy; and Humboldt observes, that 'public coaches will doubtless one day roll from Philadelphia and Washington to Mexico and Acapulco.' The chief difficulties now existing are the want of water and habitations.

241. Mines and Minerals.—With the exception of the mines of the precious metals in Mexico, almost all our mineralogical knowledge of North America is confined to the United States. Silver has never been discovered in the United States, except in very small quantities. Sand containing gold has been found in Cabarras county, in North Carolina; in the beds of Meadow creek, a branch of the Pedee, and other small streams. Between 1810 and 1820 gold was sent to the United States' mint from this place, which was valued at 19,000 dollars, and the amount is said to be increasing.

242. There are numerous and inexhaustible beds of iron ore in the United States, particularly along the Allegany or Apalachian mountains, from Franconia in New Hampshire, to Georgia. Twelve mines are now open in Virginia; Kentucky, Tennessee, and Ohio, also abound in iron. New York, New Jersey, and Pennsylvania, produce ore in abundance, of a

quality not exceeded in Sweden. New Jersey, besides the iron-stone in the north, has extensive beds of bog-ore on the coast, which are renewed some years after they have been once exhausted. Similar beds occur in other parts of the alluvial coast, south of New Jersey; but they are not extensively wrought. In Connecticut, important mines are wrought at Salisbury, and at other places in Litchfield county. Massachusetts has a number of mines; and the green mountains of Vermont contain numerous beds of ore.

243. Copper is often found in pure metallic masses, sometimes very large, on lake Superior. A single mass on the Onontagon river is estimated to exceed a ton in weight. Copper ore is found in many parts of the United States; but no mines are now wrought. That of Belleville near Newark, New Jersey, was formerly very productive.

244. The United States also contain several extensive beds of lead ore. The mine at Southampton, Massachusetts, is the principal now wrought east of the Mississippi. Lead is found, however, on the Schuylkill river; on the Great Kenhawa; at Middleton, Connecticut; and in most of the states comprised in the primary and secondary regions. The lead mines of Missouri, lying near the Mississippi river, are among the richest in the world. The ore is found abundantly, within two feet of the surface, in detached masses weighing from 1 to 1800 pounds. The annual produce is estimated at three millions of pounds. Dubuqu's lead mines, on the Mississippi, have been wrought, until recently, by the Indians, who sold the ore to the whites; and have produced 30,000 or 40,000 pounds annually.

245. Mercury has been discovered in small quantities in the form of black and red sand. It occurs on the southern shores of lakes Michigan, Huron, St. Clair, and Erie, as far east as the mouth of Vermilion river. No considerable deposit has been discovered. A single mine of cobalt has also been discovered, and is now wrought on the Connecticut river, near Middleton. Slate and free-stone, and other fine building stones, are abundant and excellent in the United States. Marble is also found extensively, and often of great beauty. The quarries are chiefly wrought in a range of limestone, which extends along the edge of the secondary region, through the western parts of Vermont, Massachusetts, and Connecticut. Some produce fine white marble. In other quarries it is beautifully clouded. Pursuing the same directions along the Blue ridge, we find other beds of marble—at Kingsbridge, in New York; and in Montgomery and Lancaster counties, in Pennsylvania, most of which are primitive. At Milford, near New Haven, Connecticut, there are quarries of yellow, and also of green variegated marble of uncommon beauty; the last resembling the celebrated verd-antique. On the Potomac river, in Maryland, there are extensive beds of a secondary breccia marble, which is finely diversified with pebbles and fragments of various sizes and colours. The columns of the capitol at Washington are composed of this marble.

246. The United States are well supplied with coal. One of the most extensive coal mines now wrought, is near Richmond, Virginia, in a bed of bituminous coal, twenty miles in length. Large quantities are exported to other states.

247. In Pennsylvania the coal beds are said to extend over one-third of the surface. Beds of anthracite, or stone-coal, without bitumen, of excellent quality, are found along the Susquehannah river at Reading, and across to the heads of the Schuylkill and Lehigh. Beds of bituminous coal extend from the mouth of the Juniata river, through all the country watered by the Susquehannah, to Pittsburgh. From this place they continue down the Ohio to Missouri; and along the valley of the Mississippi to the heads of the river Tombigbee. There are also indications of coal beds in the secondary region extending from New Haven to Middleton, Connecticut, and thence to Northampton. Rhode Island has a mine of anthracite; and another has recently been discovered in Worcester county, Massachusetts.

248. The interior is also well supplied with that mineral of the first necessity—salt. The Great Desert of North America is encrusted with salt in many places; and its waters are generally brackish in the dry season. In many parts of the western United States there are spots of ground so impregnated with it, that wild animals resort to them, and lick the surface: this has given them the name of salt-licks. There are numerous brine springs, also, found rising from beds of salt, so strongly impregnated, that it is obtained for use by evaporating their waters. They abound throughout the secondary region of the United States, particularly on the Ohio river and its branches, in Ohio, Illinois, Kentucky, Tennessee, and Virginia; and near the small lakes of New York. The most extensive salt works are at Salina in New York, and on the Great Kenhawa river in Virginia.

249. Gypsum, which is so valuable for agricultural purposes, was formerly obtained exclusively from France and Nova Scotia. But within a few years extensive quarries have been discovered and wrought in the interior of the state of New York. It is known to exist in considerable quantities in other parts of the United States; and it is probable that the home supply will soon be adequate to the consumption.

250. Manufactures.—With so ample a supply of raw material of easy production, it must for a long time after the settlement of a country like the United States, be most profitable to employ other nations in manufacturing. In a country so thinly settled as it still is, and affording such ready means of independent support to all classes, it will not be easy to procure labour at such a rate as to compete with the overflowing, and sometimes half-starved, population of older countries. The United States have always manufactured those coarse articles, whose bulk is a more important consideration than the labour they require. In the years 1802, 1803, and 1804, it was found that four-fifths of the manufactures consumed were produced in the United States; and the subsequent restrictions on commerce greatly increased the amount.

251. In the year 1810 it was found that the following manufactures were carried on to an extent that was adequate to a supply of the demand.

Wooden articles of every kind.
Leather and articles of leather.
Soap and tallow candles.
Spermaceti oil and candles.
Flaxseed oil.
Refined sugar.
Coarse earthen-ware.
Snuff, chocolate, and mustard.

The following branches were firmly established, supplying the greater part of the demand.

Iron and articles of iron.
Hats and straw bonnets.
Cotton, wool, flax, and hemp.
Paper, printing types, printed books, and playing cards.
Spirituous and malt liquors.
Wax candles:

Considerable progress had been made in the following branches:

Paints and colours.
Chemical preparations and medicinal drugs.
Salt.
Copper and brass.
Japanned and plated ware.
Queen's and other earthen-ware.
Glass ware, &c. &c.

252. The total annual value of the manufactures of this period, excluding all doubtful articles, was estimated at 127,694,000 dollars, of which the following are the most prominent particulars:

	Dollars.
Goods manufactured by the loom	39,500,000
Machinery of various kinds	6,100,000
Hats	4,100,000
Iron manufactures	14,360,000
Leather	17,900,000
Distilled and fermented liquors	16,530,000
Wooden manufactures	5,540,000

253. The value as distributed among the states was as follows:

	Dollars.
Maine	2,138,000
New Hampshire	8,135,000
Vermont	4,325,000
Massachusetts	17,516,000
Rhode Island	3,080,000
Connecticut	5,901,000
New York	14,569,000
New Jersey	4,703,000
Pennsylvania	32,089,009
Delaware	990,000
Maryland	6,554,000
Virginia	11,447,000
Ohio	1,987,000
Kentucky	4,121,000
North Carolina	5,323,000
Tennessee	3,708,000
South Carolina	2,174,000
Georgia	2,744,000
Mississippi Territory	314,000
Orleans Territory	35,000
Louisiana Territory	35,000
Indiana Territory	197,000
Illinois Territory	72,000
Michigan Territory	37,000
Columbia District	719,000

It was known, however, that many of the returns were incomplete; and it was presumed that the manufactures of all descriptions might be estimated at upwards of 170,000,000.

254. The war with Great Britain, in 1812, led to a great increase of manufacturing establishments, both from the difficulty of procuring foreign goods, and from the amount of capital unemployed. The return of peace, and the excessive importations which immediately took place, proved destructive to many of them; but the number remaining was far greater than at any former period, and necessity and experience had produced great improvements in the articles made, and the machinery employed. A census was ordered to be taken of the amount of manufactures in 1820; but owing to the reluctance of manufacturers to disclose the state of their affairs, merely for the information of the public, the results were too imperfect to enable us to form any just estimate of their present state. The whole number of persons employed in mechanical and manufacturing labour was 349,506, or about one-twentieth of the whole population; supposing that they bear the same proportion to the population as in 1810. Melish estimates the present value of manufactures at 225,000,000 dollars; adding the following observations and calculations:—

'We find that the value of all the manufactured goods imported into the United States in 1821 was only 32,000,000 dollars, of which 5,000,000 dollars was re-exported, leaving 27,000,000 for the consumption of the country, of which about 22,000,000 only was for clothing. We may estimate, that the total consumption of this country of manufactured articles is equal to 26 dollars for each individual; the result will be . 250,500,000
From which deduct imports . . 27,000,000

The result will give as the value of the manufactures of the country } 223,500,000

255. Again if we estimate the value of manufactures at three dollars per day for each person employed, including the raw materials; and suppose the manufacturers to work on an average 300 days in the year, the result for 349,506 persons will be nearly 315,000,000 dollars; from which deduct 90,000,000 dollars for buildings, exclusive of those for manufactures, implements of husbandry, &c and the residue will show the manufactures to be in value 225,000,000 dollars. The domestic manufactures exported in 1821 amounted to 2,755,000, and it is presumed that such exports will rapidly increase.

256. With regard to the quality of the finer articles, the manufacturers of the United States must of course generally fall below those of the nations of Europe. Still they are constantly procuring artizans from abroad; and their native ingenuity has produced many inventions of great value for perfecting and facilitating labour,

and is probably adequate to every purpose, except where the nice tact of long experience is necessary. In manufactures of glass they appear to have succeeded perfectly. Their plain cottons are often excellent and beautiful fabrics; and it is stated, that they have recently brought the stamping of calicoes nearly to as great perfection as in England. Some of their manufactories produce cloths equal to the finest seen on this side of the Atlantic; but they do not usually succeed well in their dyes. For cutlery and fine metallic articles; porcelain, and the finer earthenware; muslins, silks, and many other articles, chiefly of luxury, and for which the demand increases with the progress of refinement—they are still, and long must be, indebted to Great Britain and other countries of Europe. They are probably in a great measure independent as to the articles of necessity; and very heavy duties have recently been imposed on foreign manufactures, with the view of encouraging this branch of national industry still farther. Whether the results will be favourable admits of question.

257. COMMERCE.—The exports of the United States are distinguished in the official statements into, 1. produce of the forest; 2. produce of the field; 3. produce of the sea; 4. of manufactured articles; and 5. of foreign articles re-exported.

258. From the abundance of forests it is obvious that there can be no limit to the amount of the first, except the demand. They consist of lumber of all kinds—naval stores, or the tar, pitch, turpentine, and resin, obtained from the pine-forests; pot and pearl-ashes, procured by the burning of the timber in clearing the land; oak bark, and other dyes; ginseng, and the skins and furs of wild animals. The official value of the exports of these various articles was as follows:—

	Dollars.
Lumber, 1803 to 1807, annually .	2,500,000
Naval stores	500,000
Ditto, in 1816	800,000
Pot and pearl-ashes in 1816 . .	1,630,000
Oak and other bark and wood for tanning and dyeing, 1803 . .	225,000
Ginseng, chiefly to China, 1806 .	139,000
Skins and furs, 1804 to 1807, annually	900,000

259. The products of agriculture form the most important and valuable portion of the exports of the United States. Cotton is the first of these in importance; it constitutes one-fourth of the whole exports, and forms the staple of all the states south of 37° latitude. Next in value are wheat, maize, and rye, raised chiefly in the northern and middle states, and forming, in some years, nearly as large a part of the value of exports as cotton. Tobacco is the great staple of Virginia and Maryland, and has an importance among the articles of export which we should by no means anticipate, amounting often to 10,000,000 dollars in a year. Rice, which is found in the same parts of the country as cotton, is next to tobacco, but is now less attended to than formerly, in consequence of the superior value of cotton. Indigo, which was formerly an export of some value, has been abandoned for the same reason.

260. The following table shows the relative proportion of the different articles which were exported at several periods:

Year.	COTTON.	FLOUR.	TOBACCO.	RICE.
	Pounds.	Barrels.	Hhds.	Tierces.
1790	100,000	724,623	118,460	80,845
1795	1,300,000	887,369	61,050	138,526
1800	17,789,803	633,052	73,680	112,056
1804	35,034,175	810,008	83,342	78,385
1817	85,649,328	1,479,198	62,365	79,296

261. The products of the sea are derived chiefly from the cod and whale fisheries. Both are carried on almost exclusively from the eastern states and New York; and a large proportion of the tonnage employed belongs to the states of Massachusetts and New Hampshire. The amount of this branch of exports is much less than either of the preceding, as the home market requires a large supply of such articles; but the produce of this branch of national industry, compared with the capital invested, is very considerable. The whole amount of exports of the produce of the sea has not generally equalled the single article of rice, varying from one to three millions of dollars. The manufactured articles of export are made both from foreign and domestic materials, and are equivalent in value to the products of the sea on the average. Soap and tallow, distilled spirits, and furniture, coaches, and other manufactures of wood, are the most important articles of this class.

262. A very important branch of the commerce of the United States consists in the importation of foreign manufactures and produce, and their re-exportation to the West Indies and South America, usually called the carrying trade. It has in some years exceeded in value the trade in domestic articles, producing great increase of public revenue, as well as of private wealth and commercial tonnage. Sugar and coffee are the principal articles in amount. The duties in this case are paid by the foreign consumers, forming a clear gain to the country, which, in some years, amounts to one-ninth of the whole revenue from the customs. In the years 1806 and 1807 the freight of the sugars imported and re-exported amounted to three or four millions of dollars, and must of course have been paid in

the same way, by foreign countries, to the owners of the American carrying ships.

263. The most distinct view of this subject will be derived from an examination of the following tables of exports, in which the several articles are divided into classes, with the amount and the proportion which every foreign country receives. The amount of foreign articles exported shows the extent of the carrying trade directly from the country. But there is a considerable portion of the trade carried on from one foreign port to another which never appears upon the books of the custom-house. Thus a number of ships are constantly employed in procuring furs from the north-west coast, and sandal-wood from the Sandwich Islands, and carrying them to China in exchange for teas, silks, &c. In the year 1803 the furs entered at Canton in this manner were valued at half a million of dollars. The ships of the United States are also frequently employed in coasting voyages between the various ports on the Pacific coast of America.

264. EXPORTS FROM THE UNITED STATES, 1822.

Articles.	Value.	Country to which exported.
DOMESTIC ARTICLES.	DOLLARS.	
Products of the Sea.		
Fish	930,000	French W. Indies, $\frac{1}{4}$. W. Indies generally.
Oil & Sperm Candles	470,000	Germany, $\frac{1}{4}$. Cuba, $\frac{1}{10}$. Holland, Spain, S. America.
Total	1,400,000	
Products of the Forest.		
Lumber	1,300,000	Cuba, $\frac{1}{3}$. French W. Indies, $\frac{1}{8}$. W. Indies, British America.
Pot and Pearl Ashes	1,100,000	British America, $\frac{1}{2}$. Holland, $\frac{1}{4}$. France, $\frac{1}{7}$. England, $\frac{1}{10}$.
Skins and Furs	500,000	England, $\frac{1}{2}$ nearly. Germany, $\frac{1}{4}$. China, $\frac{1}{8}$.
Naval Stores, Tar, &c.	450,000	Great Britain, $\frac{3}{4}$.
Ginseng	300,000	China.
Oak Bark, and other dyeing stuffs	150,000	England, $\frac{2}{3}$. Germany, $\frac{1}{8}$. Russia, $\frac{1}{8}$.
Total	3,800,000	American Colonies, Europe, and China.
Products of Agriculture.		
Cotton	24,000,000	England, $\frac{3}{4}$. France, $\frac{1}{8}$.
Tobacco	6,200,000	England, $\frac{2}{3}$. Holland, $\frac{1}{8}$. Germany, $\frac{1}{8}$. France, $\frac{1}{12}$.
Wheat Flour, &c.	5,300,000	W. Indies, more than $\frac{1}{2}$. Brazil, $\frac{1}{3}$. S. America generally, and British America, each $\frac{1}{10}$.
Rice	1,600,000	W. Indies, $\frac{1}{2}$. England, $\frac{1}{3}$ nearly. Germany, $\frac{1}{12}$. Holland, $\frac{1}{16}$. and Russia.
Pork	1,400,000	W. Indies, $\frac{3}{4}$. British America, $\frac{1}{6}$. and S. America.
Corn Meal, Rye, &c.	1,100,000	Danish and Dutch W. Indies, $\frac{1}{2}$. British America, $\frac{1}{10}$. and W. Indies generally.
Beef Tallow, &c.	840,000	French W. Indies, $\frac{1}{8}$. Cuba, $\frac{1}{8}$. W. Indies, $\frac{1}{4}$. British America, $\frac{1}{7}$. England, $\frac{1}{11}$.
Flax-seed	400,000	Ireland, $\frac{3}{5}$. England more than $\frac{1}{3}$.
Butter and Cheese	220,000	W. Indies, $\frac{3}{5}$. British America, $\frac{1}{4}$.
Horses, Mules, &c.	100,000	French W. Indies, $\frac{1}{3}$. W. Indies generally. British America, $\frac{1}{4}$.
Wax	93,000	England, $\frac{1}{4}$. France, $\frac{1}{6}$. Brazil, $\frac{1}{7}$. Spain, $\frac{1}{15}$.
Hops	23,000	Germany, $\frac{2}{3}$. Denmark, France, Russia, Sweden.
Total	41,276,000	Cotton and Tobacco, Europe; remainder, W. Indies and S. America.
Manufactured Articles.		
Soap and Candles	800,000	W. Indies, $\frac{3}{4}$. S. America, $\frac{1}{4}$ nearly.
Wood, including Carriages, &c.	500,000	Cuba, $\frac{1}{3}$. W. Indies generally. S. America, $\frac{1}{4}$ nearly.
Leather, Shoes, &c.	400,000	Cuba, $\frac{2}{3}$. West Indies generally, $\frac{1}{4}$. British America, $\frac{1}{9}$.
Tobacco	160,000	West Indies, $\frac{1}{3}$ nearly. Gibraltar, $\frac{1}{3}$. S. America, $\frac{1}{3}$. British America, $\frac{1}{11}$. China, $\frac{1}{20}$.
Iron	130,000	Cuba, $\frac{1}{3}$. West Indies generally. S. America, $\frac{1}{4}$.

264. EXPORTS FROM THE UNITED STATES, 1822 —*Continued.*

Articles.	Value.	Country to which exported.
DOMESTIC ARTICLES.	DOLLARS.	
Manufactured Articles, continued.		
Beer, and Spirits from grain	120,000	S. America, $\frac{1}{4}$. Cuba, $\frac{1}{4}$ nearly. W. Indies, $\frac{1}{6}$. E. Indies, $\frac{1}{8}$.
Hats	86,000	Cuba, $\frac{1}{4}$. W. Indies generally. S. America, $\frac{1}{4}$.
Gunpowder	82,000	W. Indies, $\frac{3}{5}$. S. America, $\frac{1}{8}$. Africa, $\frac{1}{8}$.
Spirits from Molasses	60,000	Africa, $\frac{1}{2}$. Denmark and Norway, $\frac{1}{4}$. S. America, $\frac{1}{8}$. Teneriffe, $\frac{1}{12}$.
Medicinal Drugs	44,000	Cuba, $\frac{1}{4}$. West Indies generally, $\frac{1}{4}$. England, $\frac{1}{6}$. Germany and France, $\frac{1}{8}$.
Cordage	34,000	South America, $\frac{3}{5}$.
Linseed Oil & Spirits of Turpentine	28,000	W. Indies and S. America.
Refined Sugar	26,000	S. America, more than $\frac{1}{2}$. W. Indies, $\frac{1}{3}$. Gibraltar, $\frac{1}{8}$.
Total	50,000,000	W. Indies and S. America.
FOREIGN ARTICLES.		
Gold and Silver	10,800,000	China, $\frac{1}{2}$. East Indies, $\frac{1}{4}$. Asia generally, and England. France, $\frac{1}{20}$.
Coffee	1,700,000	Holland, $\frac{1}{6}$. Germany, $\frac{1}{7}$. Turkish Dominions, $\frac{1}{8}$. Russia, $\frac{1}{8}$. Italy, France, Austria, each $\frac{1}{10}$.
Indigo	1,200,000	Holland, more than $\frac{1}{2}$. Germany, $\frac{1}{8}$. France, $\frac{1}{8}$. Italy & Malta, $\frac{1}{10}$.
Sugar	1,000,000	Holland, $\frac{2}{3}$. Italy and Malta, $\frac{1}{6}$. Gibraltar, Austria, each $\frac{1}{10}$. Germany, France, Russia, $\frac{1}{20}$.
Teas	700,000	Germany, $\frac{1}{3}$. France, $\frac{1}{5}$. Gibraltar, $\frac{1}{7}$. Holland, $\frac{1}{8}$.
Spices	450,000	Holland, $\frac{1}{3}$. France, $\frac{1}{5}$. Italy and Malta, $\frac{1}{6}$. Germany, Russia.
Dye Woods	250,000	England, $\frac{1}{3}$. Russia, $\frac{1}{8}$. Germany, $\frac{1}{7}$. Holland, $\frac{1}{9}$. Sweden, $\frac{1}{10}$. Italy, $\frac{1}{12}$.
Cacao	200,000	Italy and Malta, $\frac{1}{4}$. Spain, $\frac{1}{3}$. Gibraltar and France, each $\frac{1}{6}$.
Total	17,000,000	Europe.
Exports of Domestic Articles	50,000,000	Products of Agriculture, $\frac{1}{5}$—of Forests, $\frac{1}{12}$—of Manufactures, $\frac{1}{10}$—of Sea, $\frac{1}{20}$.
Exports of Foreign Articles	17,000,000	Gold and Silver, $\frac{1}{2}$. Tropical products, $\frac{1}{4}$. Manufactures, $\frac{1}{4}$.
Total	67,000,000	

265. It is obvious from the accounts we have given, that the imports of the United States must consist chiefly of manufactured articles, and the products of warm climates. Most other articles of importance to be found within their limits, and even these are supplied to some extent from their own resources. The following table shows the various articles imported, arranged in the order of their value, with the countries from which they are procured, and the amount of each re-exported. The manufactured articles are distinguished by the letter *m*; and the products of warm climates by an asterisk (*) prefixed.

266. TABLE OF IMPORTS OF THE UNITED STATES, FOR 1822.

IN THE ORDER OF THEIR VALUE.

IMPORTS.	Value Dolls.	Re-exported	From what Countries Imported.
m Woollen Goods	12,200,000	200,000	England, $\frac{19}{20}$.
m Cotton ditto	10,300,000	1,700,000	Great Britain, $\frac{9}{10}$. China, $\frac{1}{12}$.
m Silk ditto	6,800,000	1,000,000	France, $\frac{2}{3}$. China, $\frac{1}{3}$. British E. Indies, $\frac{1}{8}$.
* Coffee	5,600,000	1,700,000	Cuba, $\frac{1}{3}$. Hayti, $\frac{1}{3}$. Brazil, $\frac{1}{11}$. E. & W. Indies. generally.
m Iron and Steel	5,200,000	300,000	Man. England, $\frac{19}{20}$. Crude, Sweden, $\frac{2}{3}$. Russia.
* Sugar	5,000,000	1,000,000	Cuba, $\frac{3}{4}$. Danish W. Indies, $\frac{1}{4}$. and other W. Indies.
m Linen Goods	4,100,000	400,000	England and Scotland, $\frac{1}{2}$. Ireland, $\frac{1}{4}$. Germany, $\frac{1}{8}$.
Gold and Silver Coin, & Bullion	3,400,000	*more exp't'd*	S. America, $\frac{1}{2}$. Cuba, $\frac{1}{8}$. Other W. Indies, $\frac{1}{4}$. Holland and Italy.
Spirits	2,500,000	200,000	France, $\frac{3}{8}$. Danish W. Indies, $\frac{1}{8}$. Holland, $\frac{1}{4}$.
* Molasses	2,400,000	4,000	Cuba, $\frac{1}{2}$. French W. Indies, $\frac{1}{3}$. Dutch W. Indies, $\frac{1}{8}$.
Raw Hides	2,000,000	40,000	S. America, $\frac{3}{4}$. W. Indies, $\frac{1}{8}$.
* Wines	1,900,000	200,000	Spain, $\frac{1}{4}$. France, $\frac{1}{3}$. Teneriffe, $\frac{1}{8}$. Portugal, $\frac{1}{8}$. Madeira, $\frac{1}{11}$. Azores, $\frac{1}{12}$. Sicily, $\frac{1}{15}$.
* Teas	1,900,000	700,000	China.
* Indigo	1,800,000	1,200,000	British E. Indies, $\frac{8}{9}$ W. Indies and S. America.
m Duck and sheetings	1,500,000	400,000	Russia.
m Copper, Brass, and tin	1,400,000	50,000	Man. England, Unwrought, England, $\frac{1}{2}$. S. America, $\frac{1}{3}$.
m Earthen and Stone Ware	1,100,000	50,000	England.
Hemp	1,100,000	4,000	Russia.
m Hats, Caps, and Bonnets	720,000	14,000	Italy, $\frac{1}{3}$. France, $\frac{1}{12}$.
Salt	630,000	1,000	England, $\frac{1}{2}$. British W. Indies, $\frac{1}{3}$. Portugal, $\frac{1}{10}$.
* Spices	500,000	450,000	Southern parts of Asia, $\frac{2}{3}$. and W. Indies.
m Glass Ware and Window	450,000	55,000	England, $\frac{5}{6}$. Germany, $\frac{1}{4}$.
Wool	400,000	—	Spain, $\frac{1}{4}$. Portugal, $\frac{3}{4}$.
* Fruits	360,000	25,000	Spain and Gibraltar, $\frac{2}{3}$. and Mediterranean ports gen.
Candles, Cheese, and Soap	360,000	66,000	Russia, $\frac{3}{5}$. and Mediterranean ports.
m Hempen Goods	330,000	14,000	Scotland, $\frac{3}{5}$. England, $\frac{2}{5}$.
* Dye Woods	310,000	234,000	W. Indies and south-west shores of the Gulf of Mexico.
Furs	300,000	1,000	Brit. America, $\frac{1}{3}$. Germany, $\frac{1}{3}$. England, $\frac{1}{4}$. S. America, $\frac{1}{4}$.
m Paints	280,000	12,000	England, $\frac{5}{6}$. Holland.
Lead	270,000	24,000	England.
* Cacao	250,000	205,000	S. America, $\frac{3}{4}$. and W. Indies.
Cigars	200,000	26,000	Cuba.
m Gold, Silver, and Precious Stones, (manufactured)	150,000	34,000	England, $\frac{3}{4}$. France, $\frac{1}{4}$.
m Cordage	150,000	22,000	Russia, $\frac{3}{4}$. England, $\frac{1}{4}$.
Coal	140,000	1,000	England, $\frac{3}{4}$. British America, $\frac{1}{8}$. Scotland, $\frac{1}{8}$.
Gypsum	120,000	—	Nova Scotia.
m Beer, Ale, & Porter	100,000	3,000	England, $\frac{9}{10}$.
m Paper	94,000	6,000	France, $\frac{5}{6}$. England, $\frac{1}{8}$.
Bristles and Glue	90,000	—	Russia, $\frac{3}{5}$. Great Britain, $\frac{1}{3}$.
Sulphur	60,000	1,000	Italy and Malta, $\frac{1}{3}$. Trieste and other Austrian ports, $\frac{1}{3}$. Russia, $\frac{1}{3}$.
m China Ware	57,000	9,000	England, $\frac{1}{2}$. China, $\frac{1}{3}$. France $\frac{1}{6}$.
* Olive oil	49,000	14,000	Italy& Malta, $\frac{5}{6}$. other European Mediterranean ports, $\frac{3}{5}$.
* Cotton	30,000	57,000	Spanish S. America.
m Gunpowder	26,000	6,000	England.
Fish	19,000	1,000	British America.
Copperas	13,000	—	England.
Alum	11,000	—	Sweden, $\frac{1}{3}$. Germany, $\frac{1}{8}$.
Burr Mill Stones	11,000	—	France.
Total	83,000,000	22,000,000	

267. The following Table, compiled from the two preceding, will show the comparative Value of Exports and Imports, and the Countries with which the United States are connected in commerce:

COMPARATIVE TABLE OF EXPORTS AND IMPORTS, 1822.

States.	Imports.		Exports.				Excess of Imports.	Excess of Exports.
	Amount.	Per Cent.	Domestic.	Foreign Produce.	Total.	Per Cent.		
Great Britain and dominions	39,500,000	48	26,400,000	3,400,000	29,800,000	36	9,700,000	—
Spain and dominions	12,400,000	15	5,300,000	3,100,000	8,400,000	10	4,000,000	—
France and dominions	7,000,000	8½	5,700,000	1,300,000	7,000,000	8½	—	—
China	5,200,000	6¼	400,000	5,500,000	5,900,000	7	—	700,000
Russia	3,300,000	4	200,000	400,000	600,000	¾	2,700,000	—
Holland & dominions	2,700,000	3¼	3,100,000	2,700,000	5,800,000	7	—	3,100,000
Denmark & dominions	2,500,000	3	1,600,000	800,000	2,400,000	3	100,000	—
Portugal & dominions	2,400,000	3	1,600,000	300,000	1,900,000	2⅓	500,000	—
Hayti	2,300,000	2¾	1,700,000	400,000	2,100,000	2½	200,000	—
Germany	1,600,000	2	1,600,000	900,000	2,500,000	3	—	900,000
Italy and Malta	1,600,000	2	600,000	900,000	1,500,000	1¾	100,000	—
Sweden & dominions	1,500,000	1¾	750,000	170,000	920,000	1 1/10	580,000	—
Turkey, Levant, and Egypt	360,000	—	6,000	400,000	—	—	—	—
Trieste and Austrian ports	270,000	—	40,000	440,000	480,000	—	—	210,000
Barbary States	—	—	—	—	—	—	—	—
Cape of Good Hope	64,000	—	6,000	—	6,000	—	58,000	—
Asia generally	170,000	—	70,000	1,100,000	1,170,000	—	—	1,000,000
Africa generally	120,000	—	70,000	70,000	140,000	—	—	20,000
South Seas	86,000	—	37,000	12,000	49,000	—	37,000	—
West Indies generally	2,000	—	520,000	25,000	545,000	—	—	543,000
Europe generally	—	—	59,000	7,000	66,000	—	—	66,000
North-West Coast	—	—	55,000	111,000	166,000	—	—	166,000
Total	83,000,000		50,000,000	22,000,000	72,000,000		18,000,000	

It appears from an examination of this table, that about half the imports of the United States are from Great Britain and her dominions, and nearly half the exports find a market in this country and her colonies. The greater part of the remaining trade is with Spain, France, and their colonies, and with China. It is obvious that commercial interests unite America with Great Britain more strongly than with any other power, and that her trade with us is too valuable to be sacrificed on slight grounds.

268. The exports of the United States appear to have doubled every eighteen years since 1769; and in 1816 they exceeded those of any other nation except Great Britain.

269. From a view of the whole subject, it will be found that the United States are at present the second commercial nation in the world. The following data are taken from the statistical work of Mr. Pitkin, whose accuracy is so well known: 'In 1807 the tonnage of British vessels which entered the ports of Great Britain from all parts of the world, (including the repeated voyages,) was about 1,482,000 tons. The tonnage of American vessels employed in foreign trade, which entered the ports of the United States, (including their repeated voyages,) was a little more than 1,100,000 in the same year.'—*Pitkin's Statistics*, p. 431. In 1800 the French vessels which entered France from foreign voyages, amounted only to 98,304 tons.

270. The whole amount of tonnage owned by citizens in the United States in 1810 was 1,424,781 tons, as entered on the custom-house-books; but, deducting for losses and old ships, it must be estimated at one million and a quarter, 1,250,000. In 1800, the commercial tonnage of England was estimated at 1,269,329 tons. In 1787 France possesed but 300,000 tons of shipping. In 1804 the whole tonnage of all the nations and states around the Baltic, including Norway, was 493,417 tons, or less than half that of America.

271. In the following page will be found a table, showing the amount of tonnage in the respective states, arranged in the order of superiority in this respect; and indicating how far each is actively concerned in commerce. The single state of Massachusetts owns a greater amount of tonnage than was owned in England in 1700. The increase of the American tonnage is not less remarkable than its actual amount. The registered tonnage was doubled in the fourteen years between 1795 and 1809, and nearly tripled in the twenty years between 1795 and 1815, although this included a period of war.

272. It will be interesting also to observe the increase and comparative state of commerce and population in several of the principal sea-ports and commercial places, as exhibited in the following table. For the sake of more easy comparison, the increase per cent. is also stated :—

Cities.	Population in 1800.	Population in 1810.	Increase per cent.	Tons of Shipping in 1794.	Tons of Shipping in 1815.	Increase per cent.
New York	60,439	96,373	60	94,061	299,617	208
Philadelphia	67,811	92,247	36	74,168	101,830	37
Baltimore	26,214	46,555	77	24,253	101,960	320
Boston	24,937	33,250	33	66,961	143,420	112
Charleston	20,437	24,711	21	40,572	36,473	
New Orleans	10,000	17,242	72		13,299	
Salem	9,457	12,613	33	23,623	34,454	40
Providence	7,614	10,071	32	12,603	14,465	14
Richmond	5,739	9,735	70		9,943	
Norfolk	6,746	9,183	27	17,594	31,628	80

273. The following table will show the proportions of the exports which are sent from each state. Some correction must be made, however, in order to ascertain the actual amount of exports produced in each. Thus New Jersey exports almost all her produce through the ports of New York and Philadelphia; and a large part of the products of Connecticut are sent to New York; and there must of course be a corresponding diminution in the nominal amounts for these states. New York receives much of the produce of these states, and of the western parts of New England. Massachusetts exports the produce of New Hampshire and Vermont, as as well as its own. The exports of Louisiana includes those of the states on the Mississippi; and therefore are much greater than the proportion of this state alone :—

274. TABLE OF EXPORTS OF EACH STATE.

States.	Domestic.	Foreign.	Total.
New York	11,000,000	6,100,000	17,100,000
Massachusetts	4,100,000	8,500,000	12,600,000
Pennsylvania	3,580,000	5,470,000	9,050,000
Louisiana	7,300,000	700,000	8,000,000
South Carolina	7,140,000	120,000	7,260,000
Georgia	5,500,000	2,000	5,700,000
Maryland	3,500,000	1,000,000	4,500,000
Virginia	3,200,000	8,000	3,208,000
District of Columbia	1,000,000	12,000	1,012,000
Maine	1,000,000	23,000	1,023,000
Rhode Island	600,000	260,000	860,000
North Carolina	600,000	. . . .	600,000
Connecticut	500,000	6,000	506,000
Vermont	450,000	8,000	458,000
New Hampshire	189,000	11,000	200,000
Mississippi	200,000	. . . .	200,000
Delaware	164,000	5,000	169,000
New Jersey	84,000	. . . .	84,000
Alabama	18,000	. . . .	18,000
All others	2,000	. . . .	2,000
Total of the United States	50,127,000	22,225,000	72,352,000

275. The comparative rank of each state in the union may be understood from an inspection of the following tables;—exhibiting the extent and density of population of each; the amount of manufactures in 1810; the valuation of real estate in 1813; and the tonnage in the same year.

The last table is a summary of all the preceding, in which the states are arranged in six classes, according to their rank, in each important respect. Thus Massachusetts, which belongs to the fifth class in extent, is found among the first in density of population, and value of manufactures, tonnage, and exports; and yields to few in the value of its real estate: while Virginia, which holds the first rank in extent and population, is below it in most other respects.

276. TABLE I.

Showing the Number of Acres and Square Miles in each State, and the Number of Acres to each Inhabitant, in 1820.

States.	Population to a Square Mile	Number of Square Miles	Number of Acres in each State	Number of Acres to each Inhabitant
Missouri	1	66,000	. . . .	. . .
Virginia	17	64,000	40,960,000	42
Georgia	6	62,000	39,680,000	120
Illinois	1	52,000	33,280,000	660
Louisiana	3	48,000	30,720,000	196
North Carolina	13	48,000	30,720,000	48
New York	30	46,000	29,440,000	21
Alabama	3	46,000	29,440,000	420
Mississippi	2	45,000	28,800,000	576
Pennsylvania	24	44,000	28,160,000	27
Kentucky	13	42,000	26,880,000	47
Tennessee	10	40,000	25,600,000	60
Ohio	15	39,000	24,960,000	43
Indiana	4	37,000	23,680,000	160
Maine	9	32,000	20,480,000	69
Michigan Territory	—	30,000	19,200,000	1600
South Carolina	18	28,000	17,920,000	35
Maryland	29	13,950	8,928,000	22
Vermont	23	10,212	6,535,680	24
New Hampshire	26	9,491	6,074,240	25
New Jersey	34	8,320	5,324,800	19
Massachusetts	72	7,500	4,800,000	9
Connecticut	58	4,764	3,048,960	11
Delaware	34	2,120	1,346,800	19
Rhode Island	61	1,508	965,120	16

277. TABLE II.

Showing the Amount of Manufactures, and the value of Houses and Lands in each of the United States.

States.	Manufactures in 1810.	Valuation of Houses and Lands in 1814—15.
	Dollars.	Dollars.
Pennsylvania	33,691,111	346,633,889
New York	25,370,280	269,370,900
Massachusetts and Maine	25,636,644	143,765,560
Virginia	15,263,473	165,608,199
Maryland	11,468,794	106,496,638
Connecticut	7,771,928	88,534,971
New Jersey	7,054,594	95,899,333
North Carolina	6,653,152	51,517,032
Kentucky	6,181,024	66,878,587
Vermont	5,407,280	32,461,120
New Hampshire	5,225,045	38,745,974
Rhode Island	4,106,074	20,907,766
Georgia	3,658,481	31,487,658
South Carolina	3,623,595	74,325,262
Tennessee	3,611,029	24,247,750
Ohio	2,894,290	61,347,215
Delaware	1,733,744	13,429,370
Louisiana	1,222,357	. . . .
Columbia District	1,100,000	. . . .
Alabama and Mississippi	419,073	. . . .
Indiana	300,000	. . . .
Missouri	200,000	. . . .
Illinois	120,000	. . . .
Michigan Territory	50,000	. . . .
Total of the United States	172,761,968	1,631,657,224

278. TABLE III.

On the Tonnage belonging to each State, in 1815.

States.	Foreign Trade.	Coasting Trade.	Fisheries.	Total.
	Tons.	Tons.	Tons.	Tons.
Massachusetts and Maine	299,298	120,653	34,298	454,249
New York	180,664	106,358	478	287,500
Marvland	88,161	65,047	. .	153,208
Pennsylvania	77,199	22,359	. .	99,558
Virginia	31,152	40,344	. .	71,496
Connecticut	33,472	24,880	1,749	60,090
North Carolina	25,826	15,185	. .	41,011
Rhode Island	29,019	9,171	. .	38,196
South Carolina	24,501	12,667	. .	37,168
New Jersey	2,465	28,735	. .	31,200
New Hampshire	24,532	3,491	1,721	29,744
District of Columbia	11,280	10,473	. .	21,753
Louisiana	13,766	3,437	. .	17,203
Georgia	11,253	4,035	. .	15,288
Kentucky and Ohio	27	392	. .	419
Michigan Territory	159	. .	. .	159
Mississippi Territory	. .	145	. .	145
Total of the United States	854,294	475,664	38,246	1,358,387

279. TABLE IV.

Showing the Rank of the States in several respects.

States.	Extent	Population.	Density of Population.	Value of Houses and Lands.	Manufactures.	Exports.	Tonnage.	Increase of Population.
Maine	4	4	4	.	4	4	2	4
New Hampshire	5	4	2	5	3	5	4	5
Vermont	5	4	3	5	3	5	.	6
Massachusetts	5	2	1	2	1	1	1	5
Connecticut	6	4	1	3	3	4	3	6
Rhode Island	6	6	1	6	4	4	4	6
New York	2	1	2	1	1	1	1	3
Pennsylvania	2	1	2	1	1	1	2	4
New Jersey	5	4	2	3	3	5	4	5
Delaware	6	6	2	6	5	5	6	6
Maryland	5	3	2	2	2	3	2	6
Virginia	1	1	3	2	2	3	3	6
North Carolina	2	2	3	4	3	4	3	5
South Carolina	4	2	3	3	4	2	4	5
Georgia	1	3	4	5	4	2	5	3
Alabama	2	5	5	.	6	.	.	1
Mississippi	2	6	5	.	6	5	.	1
Louisiana	2	5	5	.	5	2	5	2
Tennessee	3	3	4	6	4	.	.	2
Kentucky	3	2	3	4	3	.	.	3
Ohio	3	2	3	4	3	.		2
Indiana	3	5	5	.	6	.		1
Illinois	2	6	6	.	6	.	.	1
Missouri	1	6	6	.	6	.	.	1

280. Revenue and Expenditures.— The revenue of the United States is derived chiefly from the duties on imports and tonnage, and from public lands. There is sometimes an excess of revenue over the expenditure of the post-office department, and some incidental receipts, but they are trifling. The government also holds 7,000,000 dollars of United States bank stock, and is entitled to draw the dividends thereon. The expenditures consist of: 1. The expenses of the civil government, being the pay of the members of congress, at the rate of eight dollars per day for the time they are in session, and the salaries of the presidents, heads of departments, public officers, and clerks in the several departments; judges, district attornies, and all the public officers of the United States; expense of ambassadors, foreign consuls, &c. called diplomatic; and miscellaneous expenses of different kinds. 2. Military service, including fortifications, ordnance, &c.; revolutionary, military, and Indian pensions; arming the militia, &c. 3. Naval service, including new ships of war, repairs, navy-yards, &c. 4. Interest on the public debt. In 1821 the revenue and expenditures were nearly as follows:

Revenue.

	Dollars.
Customs	13,068,000
Public lands	1,031,000
Bank dividends	105,000
Arrears of old duties, and miscellaneous	60,000
	14,264,000

Expenditures.

	Dollars.
Civil, diplomatic, and miscellaneous	2,453,000
Military	5,163,000
Naval	3,304,000
Interest of the public debt	5,165,000
	16,085,000

281. Public Property.— The public property consists principally of the public lands; the United States lots at Washington; the public buildings, fortifications, arsenals, arms, ships of war, &c. The aggregate is very large; but we shall confine this view to a valuation of that part only which is calculated to bring money into the public treasury. The United States hold all the unsold lands, with certain reservations, in the States of Ohio, Indiana, Illinois, Missouri, Alabama, Mississippi, and Louisiana, and in the Michigan, North West, Missouri, and Arkansaw territories.—The extent and value may be estimated as follows:

	Acres.	Cash price per acre.	Dollars.
In Ohio	9,000,000	125 dol.	11,250,000
Indiana	10,000,000	do.	12,500,000
Illinois	30,000,000	do.	37,500,000
Missouri	15,000,000	do.	18,750,000
Alabama	12,000,000	do.	15,000,000
Mississippi	6,000,000	do.	7,500,000
Louisiana	10,000,000	do.	12,500,000
Michigan territory	4,000,000	do.	5,000,000
North West territory	2,000,000	do.	2,500,000
Arkansaw territory	15,000,000	do.	18,750,000
			141,250,000
The purchase of Florida will cost five millions of dollars; and it may be estimated that the lands in it will be worth that sum			5,000,000
			146,250,000
Lots in the city of Washington			250,000
			146,500,000

In addition to the public lands valued above, the United States hold the pre-emption rights of immense tracts of land, or the inclusive right of purchasing from the Indians, extending over several of the states and territories mentioned, and of the great territory of Missouri. The aggregate is not less than one thousand millions of acres.

282. The amount received for the sale of lands in 1820 was as follows:

	Dollars.
Ohio	399,000
Indiana	400,000
Illinois	134,000
Missouri	149,000
Alabama	431,000
Mississippi	116,000
Michigan	7,000
	1,636,000

It is presumed that the returns for public lands will be from 1,200,000 to 2,000,300 dollars per annum.

The national debt amounts to	93,424,000
To which add a fund to pay for the claims on the United States, in consequence of the purchase of Florida	5,000,000
	98,424,000
The annual interest as augmented will be	5,410,000

283. The following Table will show the state of an inferior branch of the Revenue, the Post Office Establishment, and its progressive Improvement, together with the Compensation paid to Post Masters, the Cost of the Transportation of the Mail, the incidental Expenses, the Nett Revenue of the Establishment, and the Extent of Post Roads in Miles, every fifth Year, from 1790 to 1820.

Years.	Number of Post Offices.	Amount of Postage.	Compensation to Post Masters.	Incidental Expenses.	Transportation of the Mail.	Nett Revenue.	Extent of Post Roads.
		Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Miles.
1790	75	37,935	8,198	1,861	22,081	5,795	1,875
1795	453	160,620	30,272	12,262	75,359	42,727	13,207
1800	903	280,804	69,243	16,107	128,644	66,810	20,817
1805	1,558	421,373	111,552	26,180	239,635	44,006	31,076
1810	2,300	551,684	149,438	18,565	327,966	55,715	36,406
1815	3,000	1,043,065	241,901	18,441	487,779	294,944	43,966
1820	4,500	1,111,927	352,295	26,206	782,425	—	73,492

284. The following Tables are interesting, as they form the Balance Sheet of the Accounts of *a Nation* from its Origin to the Conclusion of the late War.

TABLE I.

Showing the Aggregate Receipts of the Treasury, from the 4th of March, 1789, to the 31st of March, 1825.

Receipts.	Total Amount.	Annual Average.	Proportion of the whole.
	Dollars.	Dollars.	
From the customs	222,530,374	8,558,860	90.05
internal revenue	9,016,342	346,782	3.65
direct taxes	4,476,826	172,185	1.86
postage of letters	747,388	28,745	.30
sales of public lands	8,658,359	333,014	3.50
miscellaneous sources	1,590,001	61,154	.64
	247,019,302	9,500,000	100.00
	107,138,184	4,120,699	
Total Receipts	354,157,487	13,621,441	

285. TABLE II.

Showing the Aggregate Expenditures of the Treasury, from the 4th of March, 1799, to the 31st of March, 1815.

Expenditures.	Total Amount.	Annual Average.	Proportion of the whole.
	Dollars.	Dollars.	
For pay and subsistence of the army . . .	88,270,562	3,395,021	25.04
fortifications of post and harbours . . .	4,374,805	168,384	1.24
other military expenses	4,938,611	189,946	1.49
Indian department	1,338,040	51,463	.38
naval department	47,818,303	1,839,165	13.56
foreign intercourse	10,678,015	410,693	3.03
Barbary powers	2,405,322	92,512	.68
civil list	14,940,695	574,642	4.24
miscellaneous civil	9,909,978	381,153	2.81
public debt	167,524,588	6,443,253	47.52
account of revolutionary government . .	316,268	12,164	.01
Total expenditure	352,560,193	13,560,008	100.00

286. Public Debt.—The debt of the United States was contracted in the war for independence which continued from 1775 to 1783, amounting in all to 75,000,000 dol. It was gradually reduced till 1812, when it amounted to 45,000,000; and again accumulated by war to 123,000,000; since the peace it has been reduced to 93,000,000, which is much less than the original debt, compared with the three-fold population of the country. The following table shows the state of the debt at different periods.

Year.	*Debt.*
1791	75,469,467 dollars
1796	81,642,272
1806	74,542,957
1812	45,035,123
1816	123,016,375
1813	99,107,346
1822	93,424,000

The following were the receipts and expenditures during the late war, which produced the increase already mentioned.

RECEIPTS.

	1812.	1813.	1814.	Total.	Proportion.
From Revenue . . .	9,801,132	14,340,709	11,500,606	35,642,447	36.33
. . Loans	10,002,400	20,089,635	15,080,546	45,172,581	46.10
. . Treasury Notes .	2,835,500	6,094,500	8,297,280	17,227,280	17.57
Total . .	22,639,032	40,524,844	34,878,432	98,042,308	100.00

EXPENDITURES.

	1812.	1813.	1814.	Total.	Proportion.
Civil and Miscellaneous	1,791,360	1,833,308	2,337,897	5,962,565	5.96
Military Establishment .	12,078,773	19,802,489	20,510,238	52,391,499	52.39
Naval Establishment . .	3,959,365	6,446,600	7,312,899	17,718,764	17.71
Public Debt	4,449,622	11,108,123	8,386,881	23,944,625	23.94
Total . .	22,279,120	39,190,520	38,547,915	100,017,453	100.00

287. The following table will illustrate the increase of the United States in shipping, exports, revenue, and population, between 1790 and 1815.

	Shipping.	Dom. Exports.	For. Exports.	Revenue.	Population.
		DOLLARS.	DOLLARS.	DOLLARS.	
1790	486,090	14,200,900	1,800,000	2,410,320	3,929,326
1795	747,964	18,064,050	29,791,506	5,954,534	4,500,900
1800	972,000	31,840,903	39,120,877	10,777,709	5,305,666
1805	1,443,453	42,387,002	53,179,029	13,650,693	6,180,000
1810	1,424,781	42,366,675	24,391,295	9,384,214	7,239,903
1815	1,372,218	45,979,403	6,583,350	27,656,436	8,400,000

288. Army and Navy.—The peace establishment of the army of the United States did not exceed 10,000 men, who are distributed in the various fortresses on the sea coast, and on the Indian frontier. The militia, which includes all the inhabitants liable to bear arms, amounted in the returns in 1816 to 748,566. They are only called out for exercise a few days in a year; and therefore cannot be regarded as an efficient force of much importance, except in case of invasion. The navy of the United States consists of fourteen ships of the line, thirteen frigates, and twenty sloops of war, and smaller vessels, amounting in the whole to forty-seven sail. Sixteen of these were in commission in 1823.

289. Religion.—The United States present the first, and almost the only example of a nation which allows no superiority; and refuses no privilege or office on account of any religious opinion. It is not uncommon to find a Jew holding a civil office. This undistinguishing protection of all sects has not produced a greater variety of religious opinions than in other countries. Most of them are derived from England; and the few which had their origin in America, do not exceed in number or in fanaticism those which are found in Europe. The want of an establishment leads to a more open avowal of sentiment than in those countries where conformity is connected with promotion, and aids

the projects of avarice or ambition; or where dissent exposes to the loss of privileges and respectability, or the infliction of penalties and fines. The line of division between the believer in Christianity and the infidel is more strongly marked; and infidel sentiments are expressed more boldly from this cause, and from that bold independence of character which has been charged upon the American as preventing even the proper attention to the civilities of life. Certain it is that in the most populous portion of this country, the northern states, religion is decidedly and generally respected; and infidelity discountenanced, as a matter of opinion, by the mass of the community.

290. The most prevalent denomination of Christians are the Presbyterians, if we may be allowed to use this term as it is sometimes employed by the persons in question, as a convenient generic term, referring to those who maintain the equality of all Presbyters in opposition to Episcopacy. They are divided into two portions, the Presbyterians strictly so called; and the Congregationalists, more nearly resembling the English Independents.

The Presbyterians are governed by representative bodies of the clergy and laity, as in the established churches of Scotland and Holland. This is the prevailing denomination in the Middle United States; and probably the most numerous south of the Hudson River. One portion of the Presbyterians, in the states of New York and New Jersey, form a distinct body under the name of the Dutch Reformed Church; it is composed almost entirely of descendants from Dutch emigrants.

The Congregationalists are distinguished from Presbyterians chiefly by the fact that each congregation claims the right of governing itself; except in those cases where it voluntarily submits to the authority of others convened in council. They embrace most of the inhabitants of the eastern United States. Most churches of these denominations maintain Calvinistic opinions. Among the Congregationalists of Massachusetts and New Hampshire there are many Unitarian churches; and their opinions are extending into other states, but the number is not known. The Baptists are probably the next denomination in point of numbers, and are rapidly increasing: they are spread throughout all the states; but two-thirds of the whole are in the southern and western states.

291. The Wesleyan Methodists form a large and increasing body, embracing 312,000 members. Of these 200,000 are in the southern and western states, 90,000 in the middle states, and 20,000 in the eastern.

292. The Episcopalians, or those who adopt the government and liturgy of the Church of England, form a highly respectable but less numerous class than the preceding. It embraces ten bishopries, and two or three theological seminaries, but possesses none of the wealth, and has none of the immense stipends to bestow on its dignitaries, which are found in the mother church.

293. The German Lutherans are found almost exclusively in the middle states. A few Moravian settlements are scattered in different parts of the country.

294. The Quakers or Friends are chiefly in the middle states: they form a large proportion of the inhabitants in some parts of Pennsylvania, which was originally settled by them.

295. The Catholics, from a mere mission in 1790, have become quite numerous. The people of Louisiana, Missouri, and Florida, are chiefly catholics; and they are numerous in Maryland. All these states were settled by Catholics. The whole number in the United States is estimated at 140,000; comprised in eighty or one hundred churches, with 160 clergymen. They have also a number of literary and religious institutions; and it is singular that the Jesuits were established here when they were expelled from Europe. There is an incorporated society of Jesuits at Georgetown, containing ninety-three members, and a Sulpitian Monastery at Baltimore. There are convents at Georgetown, Port Tobacco, and Emmetsburg in Maryland, others at Boston and New York, three in Kentucky, one in Missouri, containing in all from 100 to 200 nuns. The Catholics have colleges at Baltimore, Georgetown, New Orleans, and St. Louis; and seminaries at several other places.

296. The following table contains the most recent statements of the number of churches and preachers of each denomination:—

Denomination.	Churches.	Ministers.
Presbyterians	1,400	900
Dutch Reformed	100	90
Congregationalists	1,100	850
Total	2,600	1,840
Baptists	2,300	1,800
Methodists	2,500	1,200 itinerant. 3,000 local.
Episcopalians (ten bishops)	700	370
German Reformed	400	80
Quakers (estimated)	1,000	
Catholics (estimated)	80 to 100	160
Universalists	200	120
	9,800	8,570

297. From the above account, which does not embrace several small sects, and a number of seceding churches of each class, it appears that there are 9,800 places of worship, or one to every 1,000 people in the United States; and 8,570 of the regular clergy, or one for 1200 persons—a supply as great as that of London.

298. The clergy of the United States are supported entirely by voluntary contribution, either directly in the form of subscription, or indirectly by a tax laid by the votes of every con-

gregation upon themselves. The states of Massachusetts and New Hampshire alone retain a law, which formerly existed in some of the other states, by which every one is compelled to pay a tax to some denomination of Christians, but is left to choose for himself. The number of churches is very small which possess any fund, except as the common stock of those who belong to it, and subject it to their control. The mere fact of the erection of so large a number of churches, and the support of so large a body of clergy, is an indication that religion is regarded with general respect; and the maintenance and increase of this body is a strong testimonial of their general character. From the nature of the case there cannot be non-residents or pensionaries except among the superannuated; no living is ever placed in the gift of any individual; and the sale of church-benefices is impracticable.

299. EDUCATION.—Great care has been taken to provide for the general education of the people in the United States; and the results have been proportionally happy. It is stated, in a work which has usually expressed no favourable opinion of the United States, that 'the great body of the American people is better educated than the bulk of any European community.' *Edinburgh Review.* In many of the United States, provision is made by law for the support of common schools, either by the appropriation of a fund, or the imposition of taxes.

300. The Eastern, or New England States, are peculiarly favoured with means of instruction of this kind. The people are thickly settled in towns and villages. Every town is divided into districts, each of which is obliged to support a school during the whole or a part of the year; and it is rare to meet with a native of these states who cannot read and write. Academies are also numerous; and in Massachusetts a classical school is required by law in all places of sufficient size. Connecticut has a fund of 1,700,000 dollars for the support of schools; and thus distributes to the people a greater amount annually for the education of their children, than they pay for the expenses of the state government.

301. The middle states have been subject to a great influx of emigrants from Europe of the labouring class, many of whom are of course ignorant, and have entailed this misfortune upon their families by neglect: the state of education is much inferior to that of New England on this account. The prevalence of the Dutch and German languages in some parts of New York, New Jersey, and Pennsylvania, has also been an obstacle to the improvement of the people.

302. The state of New York has united all public literary institutions into one body under the name of the university. It has a fund of a million of dollars for the support of common schools, under the direction of the regents of the university; and in 1820 it was found that nine-tenths of the children received instruction. This state has a distinct fund of 100,000 dollars for the encouragement of literature, which is appropriated to colleges and academies at the discretion of the regents. Pennsylvania has also commenced a system of public education.

303. In the southern states the people generally live on extensive plantations, or in settlements spread over a large tract, so that it is difficult for a sufficient number to unite for the establishment of institutions for literary and religious instruction. On this account the means of education are not easily procured, except by the rich. The slaves of these states are rarely taught even to read; and in many parts of the country it is considered dangerous by the planters to give them any instruction. Virginia has established a fund of more than a million of dollars for the purposes of education, of which 45,000 are annually appropriated to common schools. Georgia and South Carolina also make some provision for the support of schools. The western states have been so recently settled, and are yet so thinly populated, that it is difficult to establish and support the means of instruction, and often difficult to obtain competent teachers, either literary or religious. In most of these states, however, a portion of land has generally been reserved by congress for the purposes of education. A foundation is thus laid for the promotion of knowledge, which will doubtless produce the most salutary effects, when the state of the country shall permit the advantageous employment of these funds. In Missouri, Ohio, Indiana, and Illinois, 1-36th of each township is devoted to schools, besides an appropriation for the establishment of colleges, sufficient, if properly managed, to found and support institutions superior to any now existing in the country.

304. The system of mutual instruction has been introduced in most of the large cities of the United States, and is gradually extending to other places where the population is sufficiently dense to render it important. Sunday-schools are very extensively introduced, not usually for the sake of elementary instruction, which is accessible to almost every one except the poor of the cities, so much as for the communication of religious instruction.

305. Extensive efforts are making to improve the system of education by the formation of schools on the plan of those of Yverdun and Hoffwyl in Switzerland; and an institution of some celebrity has been formed and conducted on the principle of applying military discipline as the instrument of government, and the means of developing the physical powers.

306. Peculiar attention has also been paid of late years to female education. Attempts have been made to found public establishments in which the sex shall be furnished with those privileges, and provided with those safeguards, arising from the employment of responsible instructors and established rules of discipline, which have hitherto been inaccessible to them from the independence and imperfection of private schools. The success which has attended these efforts thus far, is such as to encourage the hope of a favourable result, and open important improvement in the education of those who form the early character of the future guardians and governors of the state.

307. The unfortunate have not been quite forgotten in the provision for public education; and five institutions for the instruction of the

deaf and dumb have been founded in Hartford, in Connecticut, at Philadelphia, New York, and Kentucky. The three first have received legislative patronage, and some of the states have resolved to grant an annual provision for the education of the deaf and dumb. There are yet no institutions for the blind.

308. Universities and Colleges.—The United States are also well supplied with institutions for classical and scientific education. The universities and colleges of this country usually have a collection of buildings in which the students reside entirely, and live at a common table. They are in other respects organized on the plan of the colleges of Scotland; but several of them pursue a more extended course of study. Instruction is generally continued throughout the year, with short vacations. The students are superintended and taught by a number of professors, who deliver lectures on particular branches; and tutors, who direct their studies more particularly, and examine them in their daily lessons. It is also considered a part of their duty to inspect and regulate their conduct, and exercise a paternal care in forming their character. The course of study is usually four years; and degrees are conferred on examination, after a full course of instruction. The bachelor becomes master at pleasure at the end of three years; but all higher degrees are exclusively honorary, except in medicine, and are not applied for.

309. The eastern states are best provided with colleges, which were established at the first settlement of the country, and have maintained the highest reputation for discipline and learning. The two principal institutions are Harvard University at Cambridge in Massachusetts, and Yale College at New Haven in Connecticut.

310. Harvard university is the oldest in the United States. It holds the first rank in the extent of its funds, library, and means of instruction, and the number of its professors. A theological school at Cambridge, and a medical school in Boston, are connected with it.

311. Yale college at New Haven was next to Harvard in the period of its foundation. It has very limited funds, but an extensive apparatus for chemical and philosophical instruction; and the finest cabinet of minerals in the United States is deposited here by Colonel Gibbs. A medical college and theological school are connected with it.

312. The middle states have a number of seats of learning which hold a respectable rank. New York has three colleges, of which Union college at Schenectady is considered as holding the first rank. There is also an important medical institution in the city of New York. The university of Pennsylvania, at Philadelphia, is celebrated for its course of medical instruction, and some of its professors have gained great celebrity in Europe. New Jersey has a flourishing college at Princeton styled Nassau Hall, which was among the earliest institutions of the country, and has produced some of its most celebrated men.

313. The southern states are not so well provided with literary institutions, and a large number of their youth are educated in the northern states. Maryland has distinguished schools of medicine and law at Baltimore, and a Catholi college. In the district of Columbia is a Catholic college at Georgetown; and a Baptist institution called the Columbian college, has recently been founded in the city of Washington. Virginia has established a university for the state at Charlottesville with ample funds, to which 15,000 dollars are annually appropriated. Extensive and elegant buildings have been erected, comprising 104 dormitories for students, with five hotels or boarding-houses, and several houses for the professors. The expense of their erection absorbed all the funds for some years, and the institution has just come into operation. At Williamsburg is the college of William and Mary, founded in the reign of those sovereigns, which at one period had nearly fallen to decay, but is now revived. North Carolina has a state university at Chapel Hill, liberally patronized, and rapidly advancing in usefulness and respectability. South Carolina has a university at Columbia, founded in 1801, which is richly endowed from the public funds. The university of Georgia consists of a well-endowed college, called Franklin college, at Athens, and a number of academies or preparatory schools, one of which is to be established in each county under the direction of a body styled the Senatus Academicus.

314. In the western states a number of colleges have been founded on the appropriation of land made by congress; but several have not gone into operation; and others have not risen above the rank of respectable academies. At Lexington, in Kentucky, is a flourishing institution, styled the Transylvania University, which comprises a law school and a medical institution. It holds the first rank among the institutions of the western states, in the number of its professors and students, and the extent of its course of instruction.

315. Among the most distinguished scientific institutions in the United States is the military academy at West Point, on the Hudson river. It is said to rival or surpass the best establishments of this kind in Europe. A very thorough course of instruction is given in the natural, and especially the mathematical sciences (extending to the highest branches in their application to the military art), the French language, drawing, and the elements of moral and political philosophy. There are 250 students supported by the United States, each for five years. They reside in a large building, live at a common table, and are continually subject to military discipline. They are daily exercised by companies in military manœuvres; and are encamped at least three months in the year. Each in his turn has an opportunity of learning the duties of a common soldier, and of every grade of office. Those who finish the course of five years are considered candidates for any vacancy which may occur among the officers of the army.

316. In addition to the literary institutions described under the name of universities and colleges, and the provision made in a number of them for theological instruction, there are several

institutions exclusively devoted to theological students; some of which are distinguished for extensive research in biblical literature, and its kindred branches of knowledge.

317. The following tables will give a distinct idea of the state of these institutions in 1823. The tutors attend more to the detail: the students in literature are distinguished from those devoted to medicine. The colleges are arranged according to states. The theological institutions according to the denomination of Christians by whom they are supported respectively.

318. TABLE I.

States.	Colleges.	Profes.	Tutors.	Literary Stud.	Medical Stud.	Total Stud.
Maine	Bowdoin, Brunswick	4	2	123	52	175
New Hampshire	Dartmouth	8	2	141	73	214
Vermont	Middlebury			89		
———	—Castleton Med. Institution				126	215
———	Burlington University of Ver.	7		43	55	108
Massachusetts	Harvard University (32 Theological students)	20	5	267	76	386
———	Williams' College	3	2	118		
———	—Berkshire Med. Institution	7			84	202
———	Amherst	3	1	126		126
Rhode Island	Brown University	8	2	157		157
Connecticut	Yale College	13	7	374	71	473
New York	Columbia	5	2	140		140
———	Union	4	2	234		234
———	Hamilton	3	2	110		110
New Jersey	Nassau Hall	3	3	121		121
Pennsylvania	Pennsylvania Univ. Philadel.	17		50	450	500
———	Dickinson			77		77
———	Washington	2	2	50		50
———	Jefferson					
Maryland	Baltimore College			60		60
District of Columbia	St. Mary's	2		150		150
———	Columbian	4	2	86		
———	Catholic Univ. Georgetown		12	150		150
Virginia	William and Mary	4				
———	Hampden Sydney	2		120		120
North Carolina	University of North Carolina	5	3	173		173
South Carolina	University of South Carolina	4	2	100		100
Georgia	Franklin College (Georgia)	4	2	80		80
Kentucky	Greenville			80		80
———	Transylvania University (48 Law Students)	13	3	124	197	369
Tennessee	Knoxville	2		28		
Ohio	Cincinnati	1		40		
———	Athens University			120		
United States	Military School					250

TABLE II.

THEOLOGICAL INSTITUTIONS.

Denomination.	Places.	Professors.	Students.
Congregational	Bangor, Maine	2	30
———	Andover, Massachusetts	4	132
Presbyterian	Auburn, New York	3	21
———	Princetown, New Jersey	3	120
Dutch Reformed Presbyterian	New Brunswick, New Jersey	2	15
Episcopal	New York	2	22
Baptist	Washington, District of Columbia	3	
———	Waterville, Maine	3	57
———	Hamilton, New York		
Lutheran	Hartwick, New York		10

319. The number of preparatory schools under the name of grammar schools and academies, is too great for particular detail; and the number and character of private schools is highly respectable. A few of the former are supported by legislative provision, and others were established upon funds bestowed by private donors; but they are generally dependent on the fees of tuition.

320. From the tables it appears that more than 5000 young men are continually in a course of scientific and classical education in the colleges of the United States; and many more acquire a competent knowledge of science and literature in the secondary institutions, both public and private, which abound in every part of the country. No religious test is required for admission into any of the colleges; and the expenses are so moderate, that they are accessible to all classes of the community. Not a few enjoy these privileges who have no resources but such as they obtain by their own efforts in the periods of vacation.

321. None of the institutions of this recent empire are provided with those magnificent buildings and libraries, and those immense funds which have been accumulating for ages in the universities of Europe. They have no provision for fellows, and few scholarships. On all these accounts they cannot have that mass of learning which is collected in the venerable institutions of the old world: nor do they attempt that attention to minute accuracy in the ancient languages which is deemed so necessary in Europe, but which is here not demanded in any employment of life; nor to the more abstract and speculative parts of mathematics. They conform to the spirit of the people in attending most to objects of practical utility. In the apparatus, and collections, and course of instruction in the physical sciences, some of them surpass the English universities; and, if we may believe respectable travellers, almost all are supplied with what is essentially necessary. The officers are left in some measure dependent on the resort of pupils for their support, and therefore have a strong stimulus to the faithful discharge of their duty. A sinecure in these institutions is scarcely known. At the same time the discipline usually brings every student under the immediate inspection of a responsible officer, and obliges him to some degree of industry in order to continue in the institution. On all these accounts it is questionable whether the actual effect of these institutions, in diffusing valuable knowledge through the community (the most important object in a new and rising country), is not greater than that of the more splendid and aged institutions of other nations. That this plan leaves the nation dependent on foreign countries for researches and discoveries in literature and science, is an obvious evil resulting from this system, but probably the least important in existing circumstances.

322. History.—1. *From the settlement to the peace of* 1783.—The greater part of the present territory of the United States was originally called Virginia, in honour of Queen Elizabeth, by whom it was granted. The earliest settlement effected under this grant was in 1607, within the limits of the present state of Virginia, under the authority of James I. Several years afterwards a colony of Dutch commenced a settlement upon the present island of New York, and retained possession until 1664, when it was surrendered to an armament fitted out by Charles II. Massachusetts was settled in 1620 by a body of Puritans from England, and New Hampshire in 1623. The next settlement, in order of time, was that of Delaware, by the Swedes. Connecticut and Maryland were colonized contemporaneously—the former by emigrants from Massachusetts in 1633; the latter by a party of Roman Catholics from England under Lord Baltimore. Religious persecution drove a number of persons from Massachusetts, and led to the founding of Rhode Island in 1636. In 1663 some of the Virginian settlers laid the foundation of North Carolina, which was followed by the settlement of South Carolina in 1670. New Jersey, on which the Dutch and Swedes had made partial settlements early in the seventeenth century, was not effectually colonized until after the year 1670. In Pennsylvania also a small body of Swedes had planted themselves at an early period. The settlement increased slowly, until the arrival in 1681 of William Penn, with a numerous company of Quakers, whom the prospect of relief from persecution induced to emigrate. The last settled of the original thirteen states was Georgia, founded in 1732 by general Oglethorpe.

323. The history of all new colonies is necessarily one of hardship and suffering. In the case of most of the American settlements, however, the ordinary evils were augmented by the vindictive hostility of the natives, who saw with indignation the tide of Christian dominion gradually overflowing their land, and who used every means to stay its progress. Their most sagacious chiefs, from Philip of Pokanoket to Tecumseh, have endeavoured to unite the different tribes in a common purpose of opposition, but without much success. The superior arts of the Europeans generally triumphed in the engagements of bodies of men; but it was in the surprisal and assault upon individuals or families that Indian hostility was most effective. The settlements of Massachusetts, New Hampshire, Maine, and Virginia, especially, were for a great number of years the theatres of sanguinary conflicts. In Rhode Island, Pennsylvania, and Maryland, a system of policy more humane and prudent conciliated the savages, and advanced the prosperity of the settlements. Another fruitful source of disquiet to the colonies was the adjoining settlements in Canada. The British and French provinces, which would otherwise, it is probable, have remained at peace with each other, were compelled to take part in the unceasing wars of the mother countries, and wasted their young strength in supporting projects of European aggrandizement, in which they themselves were but remotely interested. This grievance fell with the greatest weight upon the colonies of New York and New England. The influence which the governors of Canada have always possessed over the Indians, enabled the French to direct the full force of savage hostility against the

English colonists The frontiers were, during every war, a scene of desolation and bloodshed. The colonists saw that nothing short of the expulsion of the French from Canada would be sufficient to ensure their repose: they devised frequent plans for the conquest of that province, and urgently called on the British government for assistance. In 1690 commissioners from the eastern and middle colonies met at New York, to concert measures for an expedition against the French colonies. The enterprise failed through the tardiness of the British admiral. Similar attempts were made in 1692 and 1696, but from similar causes they also were unsuccessful. At the beginning of the eighteenth century the colonies enjoyed a short period of repose. The renewal of the war in Europe, however, brought upon them again all the horrors of Indian and French hostility. New York and New England had previously been the chief theatre of Indian incursions; but the extension of their settlements on the Ohio gave the French an opportunity of leading the savages against the frontier inhabitants of Pennsylvania and Virginia. The colonies of South Carolina and Georgia were equally harassed, during the first half of the eighteenth century, by the Spaniards and southern Indians. In the year 1745 a resolute and successful attack was made upon the strong fort of Louisbourg, in the island of Cape Breton, by a small body of New Englanders, headed by William Pepperell, a merchant of Boston.

324. After the peace of Aix-la-Chapelle, the colonies were for a short period unmolested, until the conflicting pretensions of the two nations to lands on the Ohio produced another contest. To enable themselves more effectually to resist their enemies, some of the colonies proposed about this time the formation of a federal government, to be administered by a grand council chosen by the provincial assemblies. The British ministry, however, refused to accede to the project, without such modifications as would have given them the absolute control over the general congress; and the colonies being equally averse to this alteration, the plan was abandoned. The year 1755 was rendered memorable by the defeat of the British General Braddock, whose army was saved from entire ruin by the skill of Washington, then a colonel of provincial militia, and by the courage of the colonial troops. In 1758 Fort Duquesne, now Pittsburg, was taken by the British and provincial troops. Louisbourg, which had been restored to France, was also taken; and the tide of success set so strongly in favour of the British, that in the succeeding years Quebec and the whole of Canada were conquered. The American colonies, now relieved in a great measure from a state of harassing warfare, began to acquire with rapidity wealth and population. Their improved condition attracted the notice of the mother country; who, forgetful that the colonies had struggled almost unaided through their difficulties, many of which difficulties had arisen from her absurd and oppressive regulations, assumed the credit of their thriving appearance, and resolved to provide some remuneration for her fancied exertions in their behalf.

325. The inhabitants of Great Britain laboured at this time under a load of taxation, part of which burden it was determined to transfer to the Americans. The first step taken in pursuance of this resolution, was to impose a stamp duty on instruments of writing executed in the provinces. An act was accordingly passed to this effect by the British parliament in 1765. It was resisted from the first moment by the colonies. Delegates from the several provinces assembled at Philadelphia, who with great unanimity agreed upon a declaration of rights, and a statement of their grievances. The people at large entered into associations against the importation of British manufactures, which, notwithstanding their previous dependence for clothing upon England, were adhered to almost universally. This determined resolution compelled the British ministry to repeal the obnoxious act. The concession was received with gratitude, and for a short period tranquillity and prosperity prevailed. The intention of subjecting the colonies to the payment of taxes was not however abandoned. In 1767 an act was passed, laying duties on certain articles imported into the colonies. The latter, equally determined in their resolution not to submit to what they deemed an oppressive and unlawful measure, refused to recognise the right. The British government at length repealed all the duties, except those upon tea. To counteract the design of collecting this duty, the inhabitants of the provinces entered into an agreement not to import or consume the article. For some time matters remained in suspense, without any direct opposition to the laws. At length, a large quantity of tea being sent to Boston, it was seized by the people and thrown into the sea. When intelligence of this proceeding reached England, measures of the most severe kind were resolved upon. An act was passed for closing the port of Boston, and other acts directed against the charter of Massachusetts. A feeling of indignation broke forth in all parts of the continent. Even those provinces the most remote from Massachusetts, and which had experienced practically none of the evils of which that province complained, were zealous and ardent in the common cause. Massachusetts assembled a provincial congress, voted to raise men and money, and recommended a general assembly of the provinces to be held at Philadelphia. According to this recommendation, a congress of delegates convened in August, 1774; and, after approving of the proceedings in Massachusetts, and pledging themselves not to import from, or export to Great Britain, concluded their session by addressing an earnest remonstrance to the British government. The latter, still resolving to force the colonies to submission, sent over a large additional military force, and passed laws restraining the trade of all the colonies, except North Carolina, Delaware, and New York. By this exception they hoped to produce disunion among the provinces, but they refused an advantage offered to them at the expense of their countrymen. In the mean time warlike preparations were making in Massachusetts, as well as on the British side, and it was soon perceived that a contest was unavoidable.

326. Lexington in Massachusetts was the scene of the first conflict between the Americans and English. Some military stores having been deposited at Concord, about eighteen miles from Boston, General Gage, the British commander, sent a body of 800 regulars, on the 18th of April 1775, to obtain possession of them. Intelligence of their intentions had previously reached the country, and the alarm was given by the ringing of bells and the firing of guns. At Lexington the British fell in with a small party of seventy militia men, upon whom they fired, and killed eight, and wounded several. The fire was returned by the militia, who then retreated. At Concord the British found another party of militia, upon whom they again fired. Having succeeded in destroying the stores they commenced their retreat, in the progress of which they were reinforced by Lord Percy with 900 men. During this retreat the Americans kept up a constant fire; and though the British party effected their return to Boston, it was with a loss of 273 in killed, wounded, and prisoners. A strong reinforcement arrived soon afterwards from England, and was principally stationed in the town of Boston, while the New England troops occupied different posts in the vicinity. An important eminence, called Bunker's Hill, near Boston, was taken possession of, and partial entrenchments were thrown up by the provincials on the night of the 16th of June. The number of militia and others, by whom the post was occupied, was about 1500. At noon of the next day a body of three thousand British regulars advanced to dislodge them. The provincials reserved their fire until the British had approached to within one hundred yards of the works, when they discharged it with such destructive effect, that the column retreated in the utmost confusion. Twice did these undisciplined men put to flight a body of veteran troops double their own number. At the third onset the powder of the Americans began to fail, their position was raked by the ships and the British field-pieces, their redoubt was assailed on three sides at once, and, having in vain endeavoured to oppose the bayonets of the British with the butts of their discharged guns, they were compelled to abandon their posts. Their retreat was effected in good order over Charleston neck. The loss of the royal troops in this action, in killed and wounded, exceeded 1000 men; that of the provincials was 453 killed, wounded, and missing. Among the killed was General Warren, whose death was greatly and universally lamented.

327. The Continental congress, which convened again at Philadelphia on the 10th of May, now determined to raise forces in the name of the United Colonies. On the 15th of June they unanimously elected George Washington, then a member from Virginia, commander-in-chief of the troops. On the 2nd of July he arrived at Cambridge, and took command of the forces stationed there. With these undisciplined troops, ill supplied with the munitions of war, Washington undertook the siege or rather the blockade of Boston. Towards the close of this year a bold but rash attempt was made upon Canada by a body of provincials, under Generals Montgomery and Arnold. The former invaded Canada by the lakes, while the latter ascended the Kennebec; and after a march through the wilderness, during which the men underwent excessive toils and privations, they succeeded in reaching Quebec. Here they found themselves without the means of carrying on a regular siege; and after a month's delay they attempted to carry the place by escalade. Two attacks were made at once by Montgomery and Arnold. The former was killed while leading his men; the latter was wounded. Many of the Americans were killed or captured, and the remainder were driven from the walls. The attempt was then abandoned, and the survivors with difficulty reached the United States. The British remained in possession of Boston until March 1776, when they embarked on board of the fleet, and sailed for Halifax. General Washington then moved his army southward, and established his headquarters at New York.

328. While these affairs were in progress, congress had vainly attempted to obtain a repeal of the obnoxious edicts from the British government. They addressed themselves to the king, to the parliament, and to the people. Finding their remonstrances fruitless, they solemnly declared the colonies free and independent, and established a general government. This act took place on the 4th of July 1776.

329. On the 23rd of August British troops to the number of 24,000, commanded by Sir William Howe, landed on Long Island, about nine miles from New York. The American forces at this time amounted in number to about 17,000, and those principally raw troops. A partial engagement took place near Brooklyn on the 27th, in which the British were victorious. Washington, deeming it inexpedient to risk a general battle, retired from New York Island, which was entered by the British on the 14th of September. The retreat of the Americans was continued through Jersey and across the Delaware into Pennsylvania. Fort Washington, the only post left on New York Island, was attacked on the 12th of November, and surrendered after an obstinate resistance. The garrison, consisting of 2700 men, fell into the hands of the enemy. Fort Lee, on the Jersey shore, opposite, was also taken, but the garrison effected their escape. In addition to these misfortunes, great numbers of the militia, whose term of service had expired, returned to their homes, and the remainder were dispirited by the success of the enemy, and destitute of almost every article of comfort. The British pursued with rapidity, but were unable to reach the Delaware before the retreating army had crossed. The pursuit was then given up, and the main body of the enemy cantoned in the vicinity of the river. During the autumn and part of the winter of 1776 the prospects of the United States wore a most gloomy aspect. The once formidable army of Washington was reduced by desertion, disease, and the expiration of the term of service, to a handful of half-naked and disheartened men; while the invaders were numerous, well-organized, and flushed with success. The idea of submission was, however, spurned both by congress and the army; and

the enterprise of Washington soon gave a brighter aspect to affairs. Detachments of Hessian troops had been stationed at Trenton, Bordentown, and Princeton. Upon one or more of these points he resolved to make an attack. Accordingly on Christmas-eve he crossed the Delaware, surprised the post at Trenton, and, after a short resistance, took 1000 prisoners. A few days afterwards, having sent his prisoners to Philadelphia, he eluded the main body of the British, captured or destroyed a large party at Princeton, and finally compelled the enemy to evacuate the principal part of New Jersey.

330. During the spring of 1777, his manœuvres prevented the enemy, though possessing a vastly superior force, from advancing to Philadelphia by land. General Howe therefore changed his plan of operations, and determined to attack the city from the south. He sailed for the Chesapeake, and landed at the head of Elk. Washington, as soon as the arrival of the fleet in the Chesapeake was known, pushed forward with his army, and fronted the enemy at Chad's Ford on the Brandywine. The British not daring to attack the Americans in front, crossed at a ford higher up, and assailed the right of Washington's army. After a short but warm contest, the Americans retreated with the loss of 1200 men, the British losing about half that number. Washington, convinced by the result of this engagement that general battles were to be avoided in the undisciplined state of his army, now left Philadelphia to its fate. On the 26th of September Sir William Howe entered the city: his army was principally stationed at Germantown, about six miles from Philadelphia. Washington determined to make an attack upon this post: the plan was well conceived, but accidental causes rendered it unsuccessful. A severe action took place, in which the loss of the Americans was double that of the British.

331. During the progress of these operations, events had occurred in the northern part of the United States eminently beneficial to the cause of the colonies. For the purpose of opening a communication between New York and Canada, and cutting off the intercourse between the eastern and southern states, a force of upwards of 10,000 men, under General Burgoyne, advanced by way of lake Champlain towards Albany in June 1777. Their first operations were highly successful. Ticonderoga, garrisoned by above 3000 men, surrendered after a short siege; and, notwithstanding the obstacles thrown in his way by the provincials, Burgoyne reached the Hudson within thirty-six miles of Albany. The aspect of affairs, however, soon changed. The American army, under General Gates, was stationed in his front, and the patriotism of the people rendered supplies of provisions very precarious. A body of Hessians, in number about 500, which had been despatched by Burgoyne to seize some stores of provisions at Bennington, was attacked by General Starke with about an equal number of the neighbouring militia. The greater part of the Hessian detachment was captured, and many were killed or wounded. A reinforcement, which was sent by Burgoyne, met with the same fate. After vainly endeavouring to retreat, and after two actions in which his best troops were defeated by the Americans, General Burgoyne surrendered his whole army at Saratoga on the 17th of October. This event proved of the utmost importance to the cause of independence. It gave confidence to the people, afforded a supply of the munitions of war, and produced a powerful effect upon the dispositions of foreign governments. Soon after the intelligence reached Europe, a treaty of alliance was concluded between the United States and France. In pursuance of which a fleet and army were despatched to the assistance of the Americans. The preceding winter had been spent by Washington and his army in a hutted encampment at Valley Forge, where they endured, with fortitude, sufferings and privations under which mercenary soldiers would have sunk. On the retreat of the British they advanced with alacrity in pursuit. Their numbers and state of discipline, however, were not such as to authorize Washington to lead them into a general engagement; and, except at Monmouth, when a partial action took place to the advantage of the Americans, the British reached New York without much loss. During the remainder of the year 1778 no other event of importance occurred, than an attempt on Rhode Island by the Americans under General Sullivan; which failed, owing to the want of a promised co-operation on the part of the French admiral.

332. In 1779 the principal operations of the British armies were in the southern states. Savannah was captured; but an attempt on Charleston was gallantly repulsed. The only event of importance in the north was the capture of the strong post at Stoney Point, which was carried by assault by a small party of Americans, headed by the gallant General Wayne.

333. In 1780 the war was continued with vigour in the south. A large force was despatched by the British to Carolina. Charleston was compelled to surrender, and a great part of the country overrun by the invaders. To relieve the inhabitants, congress despatched General Gates with a respectable force. He resolved on a general action, and was totally defeated by Lord Cornwallis, at Camden, with great loss. He was succeeded in the command by General Greene, whose talents restored hope to the Americans: by dint of great exertions he collected together the appearance of an army, with which he was enabled to make head against the British. In September of this year a treacherous attempt, on the part of General Arnold, to deliver up the important post of West Point to the British, was counteracted by a timely discovery. Arnold escaped to the enemy; but Major Andre, a British officer who came to consult with him, was taken, and executed as a spy.

334. In January 1781 a victory was obtained by General Morgan, at the Cowpens, with an army inferior in force to the British, and composed in a great measure of militia. The British, however, triumphed over the Americans in a battle fought at Guildford. Cornwallis shortly

afterwards moved his army into Virginia, and Greene returned to South Carolina; where, after suffering a partial check near Camden, he gained a decisive victory at Eutaw Springs. Cornwallis in the mean time having received reinforcements marched to York Town, in Virginia, where he threw up entrenchments. Washington, who with the French army had been threatening New York, suddenly broke up his encampment, and marched to the south to attack Cornwallis. The Chesapeake was blockaded by the French fleet; and on the 30th of September the investment of the British posts took place. After a siege of seventeen days, in the course of which several of the British outposts were carried by assault, their whole army, amounting to upwards of 17,000 men, surrendered prisoners of war. This event was decisive of the contest. An expedition against New London was made by a force under Arnold, to whom the British had given a command; but nothing further of importance occurred during the remainder of the war. The British government at length acknowledged the independence of the colonies by a treaty signed on the 23d of September 1783.

335. 2. *From the Treaty of Peace of* 1783 *to* 1822.—The successful issue of a conflict with so powerful a nation as Great Britain was highly flattering to the national pride of the people of the United States, and gave them a more elevated rank in the eyes of foreign nations than their age could claim. The mere establishment of their independence, however, they soon found was far from being sufficient to ensure their prosperity. The expenses of the war had created a debt of many millions, which remained to be paid; an excessive issue of paper currency had taken place, and produced the necessary consequences upon the public wealth and morals; and the system of confederation, which, even with the enthusiasm by which it was upheld during the war, had been found inefficient, now, when the impulse arising from a common danger no longer operated, became merely a nominal bond. The recommendations of congress, though supported by the most cogent reasons, were generally disregarded: the country was drained of its specie to pay for foreign goods; the value of the public stock sunk to two shillings in the pound in consequence of the want of funds to pay the interest; and every thing indicated a dissolution of the confederacy, and approaching anarchy. This alarming state of things excited in the friends of order an earnest desire for a change in the confederation. At the instance of the legislature of Virginia, commissioners from five of the states assembled at Annapolis in 1786; who, having taken the subject of the commercial difficulties into consideration, proposed a meeting of delegates from each state, for the purpose of revising the confederation. On the 19th of May, 1787, they convened at Philadelphia; and, on the 17th of September, laid before congress the result of their labours in the existing constitution of the United States. This instrument was well adapted to unite the states more closely: the republic was rendered more formidable to other nations, and the general government gained the requisite power and authority in its internal concerns, without diminishing the liberty of the people. Public opinion, however, was divided on the question of its adoption or rejection. The subject was discussed with great warmth and ability on either side. Conventions were called in each state. In some the ratification of the constitution was obtained with difficulty, and it was not finally adopted by the little state of Rhode Island until after the lapse of two years. Eleven states having ratified it, the government went into operation in 1789. At this period arose the two great parties which have since agitated the country—the federalists, who advocated the constitution; and the anti-federalists, who opposed it.

336. However discordant the opinions of the American public in relation to the constitution, there was but one sentiment with regard to the individual by whom the office of president should be first filled. Washington was unanimously chosen president, and accepted the office with unfeigned reluctance. John Adams was chosen vice-president. The beneficial effects of the new system of government, administered as it was by such men, was soon perceived. Trade revived, confidence was restored, and the condition of the people sensibly improved. During the war that arose out of the French revolution, the United States remained neutral. The wise policy of Washington discouraged all proceedings tending to involve the country in a contest with either party.

337. The feelings of a large portion of the community were warmly enlisted on the side of France, and would have urged the nation into hostilities with England The neutral course pursued by the government met with opposition; and increased the hostility of the two parties, which, under the names of republicans and federalists, had so long divided the nation. In 1790 the Indians commenced a war on the north frontier. General Harmer was sent with 1500 men to repulse the invaders; but, after some successes, was routed with considerable loss. General St. Clair was appointed to succeed him; but, without any ground of accusation, was equally unfortunate. Some additional troops were now raised; and the Indians were finally routed and dispersed by General Wayne in 1794. To support this war an excise was laid on whisky. In consequence of this, an insurrection broke out in some of the western counties of Pennsylvania, which the energy and prudence of the government soon suppressed. Washington had been unanimously re-elected to the presidency in 1793; but, on the approach of the period at which this second term expired, declined a re-election in a farewell letter, which breathes the purest patriotism and the warmest affection for his beloved country. He was succeeded in office by John Adams, a distinguished actor in the revolution. During his presidency the French revolutionary government, disappointed in the object of engaging the United States in the war with England, pursued a course of insult and aggression towards them, which ended in actual hostilities. The American administration

had forborne for a long time, but at length adopted measures of retaliation and defence. A provisional army of regular troops was established, and the navy was increased by several frigates. Washington was appointed, by the unanimous consent of the senate, lieutenant-general and commander-in-chief of the armies of the United States. This illustrious citizen died shortly afterwards, on the 14th of December 1799, leaving behind the character of one of the most pure of patriots. When information of his death reached congress, resolutions expressive of the national grief for a public loss were adopted; and it was recommended to the people of the United States to wear crape for thirty days—a measure which was universally adopted. Hostilities between the United States and France continued only a few months, and were altogether confined to the ocean. Two severe and well-fought actions took place between frigates, in both of which the Americans were victorious; the first between the frigate Constellation, of 38 guns, and the French frigate L'Insurgente, of about equal force, in which the latter was captured; the second was between the same American frigate and La Vengeance, of superior force, which made her escape in the night, after having, it was believed, struck her colours.

338. In 1811 a revolution took place in the administration of public affairs. The democratic or republican party, having become the majority, succeeded in elevating their candidate Mr. Jefferson to the presidency, in opposition to Mr. Adams. During the first term of his official career the United States enjoyed a singular degree of commercial prosperity, while the benefits of free institutions were visible in the elevated character and happy condition of the people. The European war, a cessation of which had taken place, was renewed, after a short breathing time, in 1803. The principal belligerents, whose wide-spread schemes of hostility towards each other had, during the administration of preceding presidents, occasionally and seriously affected neutrals, began about 1806 to pursue a more injurious course. For the purpose of cutting off the trade with France, the British government declared a part of the French coast in a state of blockade, without pursuing the ancient mode of stationing a naval armament to enforce it. The emperor Napoleon retaliated by an edict of a similar nature, the execution of which was evidently impracticable in the state of the French marine. The English then issued their memorable orders in council, by which they forbade any trade whatever with France or her dependencies under penalty of seizure; and in a subsequent decree Napoleon declared all neutral vessels denationalized which should suffer themselves to be visited by an English vessel of war. Public indignation was strongly excited by an unjustifiable attack upon the frigate Chesapeake, which was afterwards disavowed by the British government; and was continually roused by fresh accounts of the imprisonment of American seamen from on board their own ships, as being English. It is stated, by those acquainted with the British navy at that period, that they amounted to several thousands. War was loudly demanded by one party, but it was believed the country was not prepared for it. A system of restrictions upon commerce, which should operate towards both belligerents, was therefore attempted. In December 1807 an embargo was laid on all American vessels, the restrictions of which were enforced by several subsequent acts. After trying an experiment of more than a year, and when it was found that this measure did not produce the desired effect in Europe, congress, yielding to the earnest petitions of the commercial interest, repealed the embargo law, and substituted an act interdicting the commercial intercourse with both Great Britain and France; but giving to the president authority to remove the restriction in case of an amicable arrangement. In the year 1809, Mr. Jefferson having declined a re-election, James Madison was chosen president. In April an arrangement was made with Erskine, the British minister, by which the latter engaged on the part of his government for the repeal of the obnoxious orders, and the president consented on the other hand to the renewal of the commercial intercourse between the two countries. The British government, however, did not think proper to ratify this act of their minister, on the ground of its having been concluded without sufficient authority. The non-intercourse with Great Britain was consequently renewed. In August 1810 the French government officially announced to the American minister at Paris, that the Berlin and Milan decrees would cease to operate on the first of November ensuing. The president accordingly issued a proclamation on the second of November, declaring that the intercourse between the United States and France might lawfully be renewed. The Indians had been again excited to war on the north-west. In November 1811 an action was fought at Tippecanoe, between an army of regulars and militia commanded by Governor Harrison, and a large body of Indians, in which the latter were defeated with the loss of upwards of 170 killed and wounded.

339. The system of restrictions upon commerce was continued until 1812, when the American government deemed it necessary to adopt more decided and effective measures. With a view to hostilities the president was authorized to augment the number of the regular army: volunteers were accepted; and the few frigates belonging to the navy were ordered to be fitted out. War was declared on the 18th of June 1812, having been recommended by the president in a message to both houses. Notwithstanding the length of time in which hostilities had been meditated, they were commenced with a very imperfect state of preparation on the part of the Americans. An addition to the regular army of twenty-five thousand men had been authorized; but few of them had been enlisted. Few persons were found sufficiently acquainted with military science to act as officers; and the volunteers and militia were undisciplined. In consequence of these imperfect preparations, and the want of sufficient foresight in other respects on the part of the government, the early operations of the war were marked by singular

ill-success. An army, composed principally of volunteers and militia, under the command of General Hull, invaded Canada from the Michigan territory in July; and, after a brief possession of a portion of the enemy's country, fell back to Detroit. The British having the command of the lake immediately cut off his communication with the state of Ohio, from which he had derived his supplies. Two attempts made to open the route failed of success. In this situation a British force, under General Brock, advanced against the American troops; and, without waiting an attack, General Hull surrendered his army prisoners of war. He was afterwards tried by a court-martial, and condemned to be shot. The president approved the sentence, but remitted the punishment in consequence of the age and revolutionary services of the general. On the Niagara frontier the operations of the Americans were almost equally unfortunate. About 1000 troops, commanded by General Van Rensselaer, crossed the river in November, and attacked the British at Queenstown. They were at first successful; but not receiving the expected reinforcements, and their retreat to the opposite shore being cut off, they were after an obstinate engagement compelled to surrender.

340. The disappointment arising from the failure of these military enterprises was in some measure balanced by the success of the Americans on the ocean. On the 20th of August, 1812, the United States' frigate Constitution of fifty-four guns fell in with the British frigate Guerriere of forty-nine guns. In the space of thirty minutes the fire of the Constitution reduced her to a sinking state, and she was forced to surrender with the loss of 100 men killed, wounded, and missing. On board the Constitution seven only were killed, and seven wounded. This exploit was followed by others of a similar nature. On the 25th of October, the frigate United States of fifty-four guns, commanded by Captain Decatur, engaged and captured the British frigate Macedonian of forty-nine guns, after an action of an hour and a half. In November the British sloop-of-war Frolic was captured by boarding, after a severe engagement with the American sloop-of-war Wasp of inferior force. Before the close of this year the frigate Constitution, being off the coast of Brazil, encountered and captured the British frigate Java. Not long afterwards the sloop-of-war Hornet fell in with and captured the British sloop-of-war Peacock of superior force, after an action of only eight minutes. The commander of the Hornet was subsequently promoted to the frigate Chesapeake, and met a reverse of fortune. On the second of June 1813 he encountered the frigate Shannon immediately after leaving the port of Boston. In eight minutes the captain of the Chesapeake was killed, and in fifteen minutes the ship struck to the Shannon.

341. The military operations of the year 1813 were productive of alternate success and reverses. The north-western frontier, on which the arms of the republic had met with a signal disaster, was again the theatre of misfortune and bloodshed. After the capture of Hull's army, the government immediately called out detachments of the militia and volunteers from Kentucky, Ohio, and Pennsylvania, and placed the whole under the command of General Harrison. The object proposed in the first instance was the recovery of Detroit. In pursuance of his plans General Winchester was sent forward to the rapids of Miami with about 800 men, with directions to commence the building of huts. Early in January he arrived at this post, and formed a fortified camp; but hearing of an intended attack upon Frenchtown at the river Raisin by the Indians, he moved forward to that place. Here, on the morning of the 22nd of January, he was suddenly attacked by a large force of British and Indians. The Americans were surrounded and surprised; and, though they fought with courage, they found themselves compelled to surrender to the number of about 1500. After the battle the English commenced their march towards Malden, leaving the prisoners in the charge of the Indians. A most barbarous massacre ensued, and of those who escaped the tomahawk or the flames many were sold into captivity. It was stated by the Americans that no effort was made to save these unfortunate soldiers, although it had been expressly engaged that they should be protected. On the Ontario frontier the American arms enjoyed a brief advantage. York, the seat of government of Upper Canada, being abandoned by the British, was taken possession of by troops under the command of General Dearborn on the 27th of April. When the Americans were within a short distance of the British works, after they had driven back the troops with the bayonet, an explosion took place from a magazine previously prepared for the purpose, by which about one hundred were killed; among whom was the commander of the detachment, General Pike, an officer of distinguished military talents and bravery, whose loss was deeply lamented. His troops, however, took possession of the fort; and, having destroyed or removed most of the public stores, the army evacuated York.

342. On the 27th of May a detachment proceeded to attack Fort George, which surrendered after a sharp contest. During the absence of General Dearborn with the troops from Sacket's Harbour, an attempt was made upon that post by a formidable force under Sir George Prevost. They were received, however, with so much coolness and good conduct by General Brown, with a small body of militia, volunteers, seamen, and regulars, that they retreated. At the Beaver Dams near Fort George, a detachment of Americans under the command of Generals Chandler and Winder, were surprised at night by a British party, and both the generals ingloriously captured. On the borders of Lake Erie the campaign opened with an attack by the British upon Fort Sandusky, in which they were repulsed with loss, by the gallant commander Major Croghan. After the defeat and capture of General Winchester, General Harrison concentrated his forces at the Rapids, where he erected Fort Meigs. The British forces advanced to this place, and commenced a siege in May 1813; in which they were unsuccessful. Notwithstanding the repulse of a body of Kentuc-

tians, who, descending the river to the relief of the fort, were defeated by the British forces, the siege was raised without any great loss having been incurred by either party. In the mean time great exertions had been making to gain the ascendency on Lake Erie. The American squadron, commanded by Commodore Perry, consisted of nine vessels carrying fifty-four guns; the British, of six vessels with sixty-three guns. On the morning of the 10th of September the two squadrons encountered each other. The action was long and well contested, and, at one period, the principal American vessel had struck her colours. A bold and unusual manœuvre of the American commander, however, decided the fortune of the day. After an action of three hours the whole British squadron surrendered, not a single vessel escaping. This victory relieved the entire north-western frontier from the presence of the enemy. General Harrison hastened to take advantage of the facilities it afforded. He embarked his main army on board of the American squadron, and, landing on the Canadian shore, immediately marched in pursuit of the enemy. Near the river Thames an action was fought on the 5th of October, which terminated in the total defeat and dispersion of the British army. With this action ended the important occurrences of the war on the north-western frontier.

343. During the early part of the war the Atlantic frontier enjoyed comparative peace. In the spring of 1813 a series of devastating hostility began on the shores of the Chesapeake, which reflected no honour on the British arms. With the hope of obtaining possession of Norfolk, an attack was made on Craney Island, which eventuated in the total defeat of the invaders. The small town of Hampton was, however, taken, and given up to plunder. During the remainder of this year the British in the Chesapeake were chiefly employed in threatening Washington and Baltimore. On the ocean the American frigate Chesapeake was captured by the British frigate Shannon, of somewhat superior force and equipment, and the sloop-of-war Argus was taken by the British ship Pelican, of superior force; but on the other hand, the British sloop of war Peacock was taken by the Hornet, and the Boxer was taken by the American brig Enterprise, of similar force. In the latter part of this year a formidable expedition was fitted out for an attempt on Montreal. The object was to be effected by the union of two divisions, one of which was to advance from Plattsburg under General Hampton, and the other to descend the St. Lawrence under General Wilkinson. The former made a short incursion into Canada, when, in consequence of a disagreement between the two generals, he returned within the boundary line. The expedition under Wilkinson, after proceeding a short distance down the river, and having encountered without much success, a body of the British, found the obstacles greater than they were anticipated, and abandoned the attempt. The army then went into winter-quarters. Early in the spring, General Wilkinson made another incursion into Canada, which ended unsuccessfully. He was soon afterwards superseded in the command. On the Niagara frontier events occurred which retrieved the character of the American arms. Great pains had been taken to improve the discipline of the troops, and prepare them to encounter veteran soldiers. The command was assigned to General Brown, who had distinguished himself at Sackett's Harbour. On the 2d of July the troops crossed, and having captured Fort Erie, with its garrison, proceeded to attack the British position at Chippewa. The respective forces were about equal in numbers. On the 5th of July a very obstinate and well-fought battle took place, which terminated in favour of the Americans, who carried all the British positions by the bayonet. Another still more warmly-contested battle occurred on the 25th of the same month. The British having been reinforced advanced towards the American position and were attacked by General Scott near the falls of Niagara. After a gallant resistance they were forced to retreat with great loss. The American force, however, was so much weakened, that it fell back to Fort Erie. The British advanced to lay siege to the fort, but their operations proved unsuccessful. An attempt to carry it by assault was defeated with great slaughter; and, in a sally upon the besiegers' lines, the Americans gained great advantages. The operations on this frontier during the remainder of the war were of minor consequence. On the northern frontier the arms of the republic obtained a naval triumph. The whole British squadron on Lake Champlain surrendered, after a warm contest, to an American squadron of inferior force. A powerful military expedition, commanded by Governor Prevost, was repulsed in an attack on Plattsburg, and compelled to abandon its views. During this year the British government availed itself of its naval force to invade the Atlantic frontier. In the month of August a body of about 4500 men was landed near Washington, and took possession of that place. After destroying most of the public buildings, they retired without molestation. The disgrace arising from this event was in some measure retrieved by the defeat of a similar attempt upon Baltimore, in which General Ross was killed. On the ocean the frigate President was captured by a squadron of the enemy, and the Essex by two vessels of superior force, after a most desperate engagement and great slaughter; but in the actions of the Epervier, the Avon, the Reindeer, the Cyane, the Levant, and the Penguin, the Americans were uniformly successful. The military operations of the war were closed by an attack upon New Orleans by a formidable and well-appointed British army, which was defeated by the Americans, under General Jackson. Peace, which had been for some time in negotiation, was concluded at Ghent on the 24th of December, 1814.

344. This treaty, which was ratified on the 17th of February, was silent with regard to the original subjects of the war, and stipulated only for the restoration of prisoners, &c. &c. the adjustment of boundaries, and an effort for the abolition of the slave-trade generally. Immediately after the ratification of peace with Eng-

land, the government resolved to chastise the insolence of Algiers, which had taken advantage of the English war to prey on American commerce. A squadron was accordingly despatched under commodore Decatur, who, after capturing a frigate and a sloop of war, compelled the Dey o sign a treaty renouncing for ever the practice of holding American prisoners in slavery. In 1819 a treaty was concluded with Spain, by which that power agreed to cede Florida to the United States. After many vexatious delays on the part of the Spanish crown, the treaty was finally ratified, and the American troops took possession of the territory in 1821. In 1822 the congress of the United States, by an almost unanimous vote in each house, recognised the independence of the late Spanish provinces in America.

BRITISH AMERICA.

CHAP. III.

345. The British possessions comprise the whole of the northern section of North America, except those tracts upon the western coast which are claimed by Russia, extending through eleven degrees of latitude, and containing more than 1,000,000 square miles: But so disadvantageous is the climate, and so thinly peopled are the inhabited provinces, that it is justly observed by Pinkerton, they sink into insignificance when compared with the great and flourishing territories of the United States and Mexico. This vast tract does not contain more than 800,000 inhabitants, while the bordering state of New York contains 1,300,000 on one-twentieth part of the surface; and Mexico has 6,000,000 on a territory of the same extent as the British possessions. Still, however, they are of great and increasing importance, and are rapidly filling with the population which is necessary to give them all the value which circumstances admit. The most striking feature in their geography, and that which renders them particularly valuable to Great Britain, is the gulf and river St. Lawrence, which forms at once a line of defence for their borders, and a channel of inland navigation of immense importance.

346. From the view that has been given of this stream, it will be perceived that the Gulf and River St. Lawrence is navigable with ships of the largest size to Quebec, nearly 700 miles from the sea. Merchant vessels ascend to Montreal, 170 miles above Quebec. Batteaux of large size ascend to Kingston, about 200 miles above Montreal. Lake Ontario is navigable with ships of large burden, 170 miles, to the mouth of the Niagara River; and that river is navigable eight miles to Queenstown. Here there is an over-land carriage of ten miles to Chippeway, from whence the river is navigable in large boats, twenty-two miles, to Fort Erie. A canal is about to be cut around the falls. Lake Erie is navigable with ships of large burden to Amherstburg, 250 miles; and the navigation is continued through Detroit River, twenty-five miles; through Lake St. Clair twenty-five; through St. Clair River, thirty-two; and through Lake Huron to the rapids of St. Mary, 250 miles. There is a portage by a canal of three miles at these rapids; and then Lake Superior is navigable to the grand portage leading to Lake Winnipeg, 300 miles, and to its west end, 150 miles more. The whole of this extended navigation is therefore 2315 miles; and it is all navigable with ships, except 213 miles, of which only ten require the use of land carriage.

347. Besides the direct navigation to the head of Lake Superior, there are various minor branches, some of them of great extent and importance; and there are many portages to the head waters of the western rivers. The Utawas or Grand River connects Montreal, by an inland passage, with the upper lakes and with James's Bay; and from the last there is a continued chain of water communication to the Arctic Ocean. The grand portage connects Lake Superior with the Lake of the Woods, Lake Winnipeg, and the interior of the country to a great extent; and from the head of Lake Superior there is but a short portage to the river Mississippi and the western waters.

348. The chief of these possessions is Canada, now divided into two provinces, called Upper and Lower Canada, separated by the Uttawas river: the former is on the north of the great lakes; the lower division, on the river St. Lawrence. On the eastern coast, south of the river St. Lawrence, are Nova Scotia, New Brunswick, and the Islands of Newfoundland, Cape Breton, and St. Johns. Labrador, and the regions around Hudson's Bay, sometimes called New Britain, are nominally subject to Great Britain also. All the British possessions are subject to a governor-general residing at Quebec. The greater part of this region is important only for the fur trade and fisheries.

349. The following table exhibits the latest estimate of the population of the British colonies in North America.

Western Territory	Unsettled
Upper Canada	300,000
Lower Canada	340,000
New Brunswick	60,000
Nova Scotia	100,000
Prince Edward's Island . . .	5,000
Cape Breton	3,000
Newfoundland	10,000
Bermudas Islands	10,000
	828,000

350. COMMERCE.—The value of articles of commerce in the British possessions may be seen in the following account of the exports and imports for 1808.

EXPORTS.		IMPORTS.		
From Quebec.	£.	*From England.*	£.	£.
Furs, and other domestic produce .	350,000	Manufactures	200,000	
Wheat, biscuit, flour	171,200	West India goods . . .	130,000	
Timber and lumber	157,360			330,000
Pot and pearl ashes	290,000	*From United States.*		
New ships	37,500	Provisions and foreign articles	100,000	
From Labrador and Gaspe.		Lumber	70,000	
Fish, lumber, oil, &c.	120,000	Ashes	110,000	
To United States, about	30,000			280,000
£	1,156,060			610,000
Number of vessels . . . 334.		Tonnage . . . 70,275.		

351. The trade between the United States and the British colonies in North America, and the West Indies, is carried on chiefly through the free ports of Halifax and Bermudas. The following was the amount of this trade in 1821.

	Dollars.
Imports of domestic produce from the United States	2,009,336
Ditto of foreign articles	455
Total	2,009,791
Exports to the United States . .	490,704

352. Lower Canada lies between 45° and 52° north lat., and between 64° and 82° west long. extending 750 miles from east to west. It is bounded on the north by the territory of the Hudson's Bay Company, or East Maine; east, by the gulf of St. Lawrence, and part of the Labrador coast; south, by New Brunswick and the United States; and west, by Upper Canada, from which it is separated principally by the Uttawas river, and a line drawn from the head of the river in lake Temiscaming due north to Hudson's Bay. It is divided into the districts of Montreal, Three Rivers, Quebec, and Gaspe, which were subdivided by a proclamation of the government in 1792 into the following twenty-one counties, viz., Bedford, Buckingham, Cornwallis, Devon, Dorchester, Effingham, Gaspe, Hampshire, Hertford, Huntingdon, Kent, Leinster, Montreal, St. Maurice, Northumberland, Orleans, Quebec, Richlieu, Surrey, Warwick, and York. The minor divisions are,—first, the seignories, or the original grants of the French government under the feudal system, which are again partitioned out into parishes; secondly, the townships, or grants of land made by the English government since the year 1796, in free and common soccage.

353. Lower Canada nominally extends north of the St. Lawrence into unexplored regions: but the only portion which is settled is the vale of the St. Lawrence, enclosed by two ridges of mountains running from south-west to north-east, dividing the waters of this stream from those of the northern and Atlantic declivities.

354. At the mouth of the St. Lawrence the country is rugged and mountainous, and the climate very severe: but in the upper and more southerly portions of the province, the country is well-watered and fertile, and the climate is milder. All parts, however, have the winters of Sweden, although situated in the latitude of France; and are liable to great and sudden heat in summer. At Montreal the spring is reckoned to commence six weeks earlier; vegetation is proportionably more vigorous and luxuriant; and the crops produced are more abundant, as they are seldom checked by the early frosts which are common in the eastern parts of the province. The thermometer rises sometimes in summer to 98°, and in winter the mercury freezes. The winter sets in early in November, and continues till April, during which the ground is entirely covered with snow, often from four to six feet deep. In January and February the frost is so intense, that there is often danger of being frost-bitten, and to guard against it the inhabitants cover the whole body with furs, except the eyes and nose.

355. The climate is still favourable to health in an eminent degree. The cloudless sky and pure dry air of winter make the cold both pleasant and healthful. No general description will convey an adequate idea of the soil of Lower Canada. In the part of the province south of the St. Lawrence, a triangular district, included between the St. Lawrence, the Chaudiere, and the parallel of 45° north lat. consists of excellent land, laid out in townships, and in many parts settled and cultivated, which bids fair to become the most flourishing part of the province. From the Chaudiere to the sources of the St. John the land is much broken, and of an indifferent quality. From the sources of the St. John to the gulf of St. Lawrence the country has been but partially explored, but has every appearance of sterility. On the north side of the St. Lawrence, a ridge of heights commences at the eastern extremity of the province, and runs along the margin of the river, from 64° to 71° west long.: it then leaves the river, and, taking a south-west direction, strikes the Uttawas river, about thirty-

eight leagues above its confluence with the St. Lawrence; enclosing between it and the two rivers a level, well-watered, and beautiful country. On the north side of the ridge just described lies the remaining part of Lower Canada, which has been so little explored that it is only known to be covered with immense forests. The principal productions are wheat and lumber.

356. The population of Lower Canada has rapidly increased within a few years. In 1759, when it was conquered from the French, it was estimated at 70,000; in 1775 it had only increased to 90,000; but in 1814 a capitation showed no less than 335,000, of whom 275,000 were descendants from the original French settlers, and the remainder English, Scotch, Irish, Americans, &c. The greater part of the inhabitants therefore are French, who are generally industrious. Their manners and customs are considerably tinctured with the French gaiety and urbanity. The French women of the lower classes in Canada can generally read and write, and are thus superior to the men; but both are very ignorant and superstitious, and blindly devoted to their priests. They universally use the French language.

357. The rivers of Lower Canada embrace several valuable islands. Montreal island is thirty miles long, and its greatest breadth between seven and eight, its circumference being about seventy miles. The land rises gradually from the river, and, at the distance of two miles and a half from the city, forms a mountain about 700 feet high, from the top of which there is a fine view. The island is divided into nine parishes, and is the seat of a very extensive population. The principal settlements, besides Montreal are—La Chine, so called from a project formed to penetrate across the continent to China from this place; St. Joseph, Le Saut, St. Laurent, St. Genevieve, and St. Ann.

358. The Isle of Jesus lies to the north-west of Montreal, from which it is divided by the River des Prairies: so called from being bordered on each side by meadows. This island is about fifteen miles long, and five broad, and contains several settlements. To the north of the Isle of Jesus is the river St. John, a branch of the Uttawas, or Grand River, a considerable stream, which towards the west is interspersed with such a vast variety of islands, that there appears as much land as water. West of this river are the Two Mountains, and south of them the Utawas river extends itself into a large basin, called the Lake of the Two Mountains, about eight or nine miles long and four or five broad, which unites with the St. Lawrence in the Lake St. Louis.

359. Lake St. Louis is only an expansion of the river St. Lawrence, about four miles broad, and stretches to La Chine, where it contracts to the breadth of little more than half a mile. Opposite to La Prairie there are considerable rapids. Below these it spreads out into a stream from one to two miles wide, interspersed with a number of islands, among which the river runs with a deep strong current. It is navigable with merchant vessels to Montreal; but from the rapidity of the current, a strong east wind is necessary to bring them up, and the passage is very tedious.

360. The mode of navigating the St. Lawrence and Utawas upwards is interesting. The St. Lawrence is navigated by flat-bottomed boats about forty-nine feet long, and six across at the broadest part. They generally carry about 9000lbs. and are conducted by four men and a guide. Each boat is supplied with a mast and sail, a grappling iron, with ropes, and setting poles. When loaded they take their departure from La Chine, generally eight or ten together that the crews may aid each other. The time of performing the voyage to Kingston and back is about ten or twelve days, the distance being about 200 miles. From twenty to thirty of these boats are kept in the service of the government, for transporting necessaries and stores for the troops, and presents of European manufacture to the Indian tribes.

361. The navigation of the Utawas, or Grand River, is performed in bark canoes in a direct course to St. Joseph on Lake Huron, and thence to the new establishment called Kamanastigua, on Lake Superior.

Foreign Trade.—The principal exports consist of lumber, pot and pearl ashes, peltry, wheat, flour, Indian corn, pulse, salt provisions, fish, and other articles, which employ generally about 150,000 tons of shipping. In return are imported wines, rum, sugar, molasses, coffee, tobacco, salt, coals, and British manufactures.—In 1821 the amount of the imports of Lower Canada was 2,185,196 dollars.

362. The prevailing religion is the Roman Catholic, under the direction of two bishops, nine vicars-general, and about 200 curates and missionaries.

363. The government is under the direction of a governor, lieutenant-governor, executive council, and legislative council, who are appointed by the king; and a house of assembly, who are elected by the people. For the defence of both the Canadas a regular military establishment is maintained by the British government, which was estimated in 1815 at from 27,000 to 30,000 men.

364 Upper Canada is situated between 24° and 25° N. lat. and between 73° 30′ W. long. and extends indefinitely to the westward. It is bounded north by the territory of the Hudson's Bay company; north-east and east by the Utawas, or Grand River, dividing it from Lower Canada; south-east and south by the United States: on the west and north-west no limits have been assigned to it.

365. It is divided into eight districts, viz. the Eastern, Johnstown, Midland, Newcastle, Home, Niagara, London, and Western. These are again subdivided into twenty-three counties and 159 townships. The townships contain, in all, 9,694,400 acres, of which 3,000,000 are granted in free and common soccage, 2,769,828 are reserved for the crown and clergy, and 3,924,572 still remain to be granted. These townships are laid out along the banks of the St. Lawrence, lake Ontario, lake Erie, and lake St. Clair; and extend back for a distance varying from forty to fifty miles. This province comprehends a vast

extent of territory; its length from east to west is about 600 miles, and its breadth about 360 from north to south. The area is about 290,000 square miles.

366. The settlements are chiefly confined to the banks of the rivers and lakes, and present a most extensive and in some places a thickly settled frontier to the United States. About 300 miles of this province border on the rivers and lakes opposite the Michigan territory; 150 on Lake Erie opposite the state of Ohio; forty-five opposite the state of Pennsylvania; and 300 on the state of New York. That part of the province which lies south of 45° latitude, between Lakes Erie and Ontario, is by far the most valuable, and the only portion which is likely to be speedily settled

367. The soil of Upper Canada, it is stated by Bouchette, is generally a fine dark loam mixed with a rich vegetable mould, not exceeded in any portion of North America. From the eastern frontier of the province to Lake Ontario, a distance of about 170 miles, the land presents an almost uniform level of exquisite beauty, rising only a few feet above the banks of the St. Lawrence, and finely intersected in every direction by numerous streams. Several of these are navigable, with occasional obstructions from falls, for boats and canoes, while they offer many choice situations for the erection of mills. On the northern shores of Lake Ontario is a ridge of heights of no great elevation, and of inconsiderable breadth, from which the land soon descends again, and forms a level fertile tract extending to Lake Huron.

368. The climate of Upper Canada is particularly salubrious; and epidemic diseases, either among men or cattle, are almost unknown. The winters are shorter and not so rigorous as in Lower Canada, and the spring opens, and agricultural labours commence, from six weeks to two months earlier than in the neighbourhood of Quebec. The summer heats are also more moderate; and the autumns are in general favourable for securing the produce of all the late crops.

369. The inhabitants are generally of British origin, and superior to those of the lower province. Many are emigrants from the United States. Agriculture is pretty well understood, and the produce is abundant; but the distance to a market, and the number of competitors from the United States, diminish its value. The grand canal of New York will doubtless have a favourable effect upon this province. Domestic manufactures are carried on to a considerable extent, and a few coarse woollens are made; but it is of course the policy of government rather to encourage the production of the raw materials which are of value to Great Britain, than of manufactures which can be served more cheaply and with greater advantage to the empire from home.

370. The government of Upper Canada is administered by a lieutenant-governor, who is almost always a military officer, a legislative council, an executive council, and a house of assembly. The legislative council consists of not less than seven members, who are appointed by mandamus from the king, and hold their seats, under certain restrictions, for life. The executive council is composed of six members. The house of assembly consists of twenty-five members, who are returned from the respective counties, and the duration of the assembly is limited to four years.

371. New Brunswick extends from Nova Scotia to Lower Canada, and from the Gulf of St. Lawrence to the state of Maine, being about 180 miles long and 120 broad. This province being united with Nova Scotia, Cape Breton, and St. John's, in one military command subject to the governor of Lower Canada, it excites no great attention either in a civil or military point of view. The soil and climate are somewhat assimilated to those of the state of Maine contiguous to it. There are a number of very extensive rivers in the interior, of which St. John's is the chief; and the soil is represented as being fertile, producing grain and grass in plenty. There are considerable fisheries on the coast and in the rivers, principally of cod-fish, salmon, and herring. The inhabitants amount to about 60,000. Frederick-town is the capital. The principal commercial towns are St. Andrew's, St. John's, and Miramachi.

372. Nova Scotia is situated between 43° 30′ and 46° N. lat. and 61° and 66° W. long. It is a narrow peninsula projecting from New Brunswick, more than 300 miles long, stretching from south-west to north-east. It is bounded north by the gulf of St. Lawrence; north-east by the island of Cape Breton, from which it is separated by the gut of Canso; west by the bay of Fundy; north-west by the province of New Brunswick; and on all other sides by the Atlantic Ocean. It is divided into nine counties, viz. Halifax, Hants, King's, Annapolis, Shelburne, Queen's, Lunenburg, Sydney, and Cumberland.

373. The north-east part of the province presents a gloomy and barren aspect; but the counties to the south-west of Halifax, and along the bay of Fundy, have a rich soil, and produce good crops of grain. The climate is milder than that of Canada, but subject to frequent fogs. The population is estimated at above 100,000; the great body of the people are principally emigrants from New England. After these the Scotch and Irish settlers are most numerous. There are valuable mines of gypsum, coal, and iron, which furnish articles of export. Roads are generally good, and communication easy; there are good harbours on the coast; and the commerce and wealth are increasing. Gypsum, lumber, and fish, are the principal exports.

374. St. John's, or Prince Edward's Island, is situated in the gulf of St. Lawrence, about thirty miles to the westward of Cape Breton, and on the north of Nova Scotia and New Brunswick, from which it is divided by a narrow strait. It is about 110 miles long and 30 broad. It is rich and fertile, containing about 5000 inhabitants, and is therefore of more importance than Cape Breton; but the climate is cold, damp, and foggy.

375. To the north and east of these islands there is a group called the Magdalen Islands, which, being entirely unsettled, merit no particular notice.

376. The large island of Anticosti also

situated at the outlet of the river St. Lawrence, is entirely barren and uninhabited.

377. The island of CAPE BRETON is situated between Nova Scotia and Newfoundland, and extends from north latitude 45° 32′ to 47° 05′, and from between 59° 42′ and 61° 30′ west longitude from London. It is about 100 miles long by 80 broad; but the soil and climate are so disadvantageous, that the inhabitants are very few, probably not above 3000; chiefly attached to the fisheries. The face of the country is covered with numerous lakes and forests. The soil has, after various experiments, been found totally unfit for agriculture. The climate is exceedingly cold, foggy, and unwholesome. There are some veins of coal in the island; but, with the exception of timber, it can scarcely boast a single vegetable production of value.

378. The island of NEWFOUNDLAND is on the east side of the gulf of St. Lawrence, separated from the coast of Labrador on the north by the straits of Bellisle. It lies between latitude 46° 45′ and 52° north, and between 53° 10′ and 59° west long.; being 381 miles long, and about 900 in circumference. The interior of the island has never been explored. The country near the shore is hilly, and the soil barren; the coasts are high and bold, and abound with large and commodious harbours. The climate is exceedingly disagreeable; the cold is severe, and of long duration; and in summer the heat, though it continues but for a short time, is violent. The coasts are extremely subject to fogs, attended with almost continual storms of sleet and snow; and, excepting a short time in summer, the sky is generally overcast with clouds. The only vegetable production of value is timber, which is abundant, and is a considerable article of commerce.

379. Newfoundland owes all its importance to the fisheries which are carried on upon its shores and upon the banks which lie to the south-east of the island. The Grand Bank, which lies 100 miles from the south-east extremity of the island, is 300 miles long and 75 broad; and the depth of water upon it varies from fifteen to sixty fathoms. No less than 3000 sail of small craft, belonging principally to Great Britain and the United States, were recently employed in these fisheries. In 1813 the export in fish and oil amounted to £1,000,000. sterling. The population of the island is very fluctuating, depending entirely on the state of the fisheries. In 1813, when they were most prosperous, it amounted to nearly 70,000. St. John's, the capital, is on the south-east coast of the island, and contained in 1815 about 12,000 inhabitants; but in 1816 and 1817 three dreadful fires laid nearly the whole town in ashes.

380. LABRADOR.—This large country was so named by a Portuguese navigator who first discovered it. In the inland parts there were American Indians, and on the coasts Esquimaux; but the former have mostly retired to the south, and even the latter seem gradually to withdraw. There were only a few factories here till the Moravian clergy formed little settlements at Nain, Okkak, and Hopedale, composed of Christianized natives. So far as it has been examined Labrador is generally hilly, and even mountainous. The eastern coast exhibits a most barren and iron-bound appearance, the rocky mountains rising suddenly from the sea; and is lined with thousands of islands abounding with the eider-duck and other sea-fowl. Rivers, brooks, lakes, pools, and ponds, are abundant, rich in fish, and frequented by innumerable birds. In the interior the air is milder; there are many trees, and some symptoms of fertility. The mountaineers of the interior resemble gypsies, with somewhat of French features, from a mixture of Canadian blood. They live in a kind of tent covered with deer skin and birch bark. They profess to be Roman Catholics, and occasionally visit the priests at Quebec.

381. HUDSON'S BAY.—The Hudson's Bay Company claim the extensive territories on the west, south, and east, of that inland sea, supposed to extend from 70° to 115° of west longitude; and, allowing the degree only thirty miles, the length will be 1350 geographical miles, and the medial breadth about 350. This vast extent of ice and snow is, however, of little consequence considered in itself; and it is not understood that the company gain great wealth. There are some fertile tracts on the southern border.

382. The regions on the west of Hudson's Bay have been called New North and New South Wales; while that on the east is styled East Maine. The most valuable settlements are in the vicinity of James's Bay, at Albany-fort, Moose-fort, and East Maine factory. To the west the Hudson's Bay Company have extended little farther than Hudson House. The Sea of Hudson commonly presents bold, rocky, shores; but at intervals there are marshes and large beaches. Even in latitude 57° the winters have the severity of the Frozen Regions already described. The fish in Hudson's Sea are far from numerous; and the whale fishery has been attempted without success. The quadrupeds and birds correspond with those of Labrador and Canada. The northern natives are Esquimaux, but there are other savages in the south: and the factories are visited by several tribes. All subsist on the products of hunting and fishing.

383. The BERMUDAS ISLANDS are situated about 800 miles from the American continent, and nearly at equal distances from Nova Scotia and the West Indies. There are a considerable number of islands in the group, but the greater part are mere rocks, and only four are of considerable importance. The largest island is named Bermudas. St. George, the capital of all the islands, is situated in the island of St. George, and contains about 500 houses. The other islands are St. David's and Somerset. The whole contain about 12000 or 13,000 acres of very poor land, of which a small part only is in cultivation. The chief produce is maize, culinary vegetables, and cotton. The inhabitants amount to about 10,000, of whom nearly one half are negroes. The principal employment is ship-building, navigation, and fishing. The climate is very fine, resembling a perpetual spring; and nothing can exceed the beauty of the scenery in these sequestered islands. The inhabitants are said to

be kind and affable to strangers, and a residence among them is very pleasant.

384. History.—The first effective settlement of this part of America was made by an armament equipped in France, by which Quebec was founded in 1608. The colonists were for many years in a feeble condition; and often in danger of extermination by the Indians. The French ultimately concluded a treaty with them, and gained the entire control over them to the great inconvenience of the neighbouring English settlements. In 1628 a company of French merchants obtained a patent for the exclusive trade with Canada. The next year an English expedition, under Sir David Keith, took possession of Quebec; but it was surrendered again to the French by the treaty of St. Germain's. In 1663 the charter of the company of merchants was taken away, and new privileges were granted for forty years to the West India Company. From this period Canada appears to have remained in a state of tranquillity until 1690, when a bold attempt was made by the people of New England to reduce it to subjection to the crown of England. An armament was equipped for this service, and the command given to Sir William Phipps. The effective men, to the number of between 1200 and 1300, landed a little below the town of Quebec, and were fired on from the woods by the French and Indians. Having found the place too strong for them they re-embarked with precipitation, and returned to Boston. The attempt was renewed in 1711 by a powerful force of British veteran troops, assisted by about 4000 provincials and Indians. Such were the difficulties and losses, however, experienced in passing up the river, that the design was abandoned by the British officers to the great mortification of the provincial troops. Canada continued in the occupation of the French, without any further molestation, until the breaking out of the war between France and England in 1756. Great preparations were then made on both sides for attack and defence. In 1759 the British government formed the project of attempting the conquest of Canada by three different but simultaneous attacks. One division of the army was to ascend the St. Lawrence and lay siege to Quebec; the central and main body was to be conducted against Ticonderoga and Crown Point; the third was to proceed against Niagara, and, after the reduction of that place, to descend the St. Lawrence to Montreal. The division which ascended the St. Lawrence was commanded by General Wolfe, and was completely defeated in its first operations by the French. Their great superiority of force, however, enabled the English to obtain possession of Quebec, after a gallant resistance on the part of the French, whose brave commander, Montcalm, had been killed in the action. The English general, Wolfe, was also killed. Soon afterwards the whole province of Canada was subdued by the English forces, and was confirmed to Great Britain by the treaty of 1763.

385. In 1775 Canada was invaded by a body of provincial troops under General Montgomery; Montreal was taken, and a gallant but unsuccessful attempt was made on Quebec, in which General Montgomery was killed. No other attempt was made on this province during the revolutionary war. We have few records of Canadian history from this period until the late war between the United States and England. Upper Canada then became the theatre of a sanguinary contest. The American troops were unable, however, to make any permanent conquests; and the province has since remained subject to Great Britain.

386. Nova Scotia and New Brunswick.—The origin of the French settlement on the isle of Sables is mentioned in the preceding sketch. Few or no English settlements of importance existed in Nova Scotia in 1749, when a large expedition sailed from England. In 1755 an English armament sailed against the French possessions; and, having taken the principal post, resorted to the cruel measure of expelling all the French inhabitants to the number of 7000, who were landed in different parts of the American colonies; many of them arrived in Philadelphia, where they were received with kindness and liberality. In 1763 Nova Scotia was formally ceded to England by the treaty of Paris, and has since remained a British colony.

387. Newfoundland was discovered by Cabot in 1497. In 1610 John Guy, with thirty-nine other persons, began a settlement on this island. By the treaty of Utrecht in 1713 Newfoundland was acknowledged to belong to England.

388. Cape Breton.—The French made the first actual settlement on this island in the year 1712. They gave it the name of Isle Royale. The fortification of Louisbourg was begun in 1720; and about that period population increased with rapidity. Cape Breton remained in possession of the French until 1745, when it was captured by a body of troops from New England under General Pepperell. Since that year it has been under the dominion of the British crown.

389. Prince Edward's, like Cape Breton, was settled by the French, and has experienced the same fortunes. In 1745, on the capture of Cape Breton, the inhabitants, who then amounted to about 4000, submitted to the British, under whose government it has since remained.

RUSSIAN AMERICA.

OR, NORTH-WEST COAST.

389.* The Russians may be regarded as the first discoverers of the north-western shores of America. They lay claim to the territory as far south as latitude 52°. About 50,000 Indians acknowledge their authority. The islands between America and Asia have the general

appellation of the Aleutian Isles, and form a chain from the American Promontory of Alaska. They are also called the Fox Isles; while the Aleutian Isles of the Russians are those which we term Behring's and Copper Isles, connecting the two continents.

390. This coast seems to be chiefly alpine; in some parts rising into snow-capped summits, with immense glaciers winding through its cavities. In this respect, and in its numerous creeks and isles, it bears no small resemblance to Norway. The most remarkable mountain seems to be that called St. Elias by the Russian navigators; and which, it is affirmed, has been visible at sea at the distance of sixty leagues.

391. The inhabitants of the more northern regions of this coast appear to be Esquimaux. The savages of Nootka are said to be very cruel to the captives taken in war, and have frequently proved treacherous in their attacks on trading vessels. Whales form a favourite article of their food. This coast abounds in seals and other furred animals, which supply the natives with a very important article of trade. A number of ships visit this coast to procure furs for the Chinese market.

SPANISH AMERICA, MEXICO, AND GUATIMALA.

CHAP. IV.

392. MEXICO.—This country, in its widest extent, embraces the whole region lying between latitude 42°. and 18°. extending from the Pacific Ocean to the Carribean Sea, the Gulf of Mexico, and the Sabine river. It is situated between 42°. and 113°. of W. long. Its extreme length from Yucatan to the north-western extremity is 2400 miles; and its breadth from the Sabine to the Pacific is 1000. The whole area comprises about 1,700,000 square miles. More than 700,000 are entirely unsettled, and occupied exclusively by the wandering tribes of Indians. The remainder does not contain more than 7,000,000 of inhabitants, or seven to the square mile, and probably a less number. Under the Spanish government it was divided into three distinct portions, which it will be convenient to observe in description:—1. California. 2. The internal provinces. 3. The vice-royalty of Mexico.

393. The following table exhibits the civil division and population of these provinces in 1803, according to Baron Humboldt:

	Divisions.	Square miles.	Population in 1803.	Chief Towns.
California	Old California	55,880	9,000	Loreto.
	New California	16,278	15,600	Monterey.
Internal provinces	New Mexico	43,731	40,200	Santa Fé.
	Sonora	146,635	121,400	Arispe.
	Durango, or North Biscay	129,247	159,700	Durango.
	San Luis Potosi	263,109	334,900	San Luis Potosi.
Vice-Royalty of Mexico	Guadalaxara	73,628	630,500	Guadalaxara.
	Zacatecas	18,039	153,300	Zacatecas.
	Guanaxuato	6,878	517,300	Guanaxuato.
	Valladolid	26,396	376,400	Valladolid.
	Mexico	45,401	1,511,800	Mexico.
	Puebla	20,651	813,300	Puebla.
	Vera Cruz	31,720	156,000	Vera Cruz.
	Oaxaca	34,064	534,800	Oaxaca.
	Yucatan, or Merida	45,784	465,800	Merida.
	Total	957,441	5,840,000	
	Unsettled, and inhabited only by Indians	753,434		
		1,710,875		

394. In 1793 the population, according to the official returns, was 4,483,529. In 1803 it was estimated by Humboldt at 5,840,000, and in 1808 at 6,500,000. This population is composed of the following classes:—1. European Spaniards. 2. Creoles, or whites, of European extraction, born in America. 3. Negroes. 4. Indians. 5. Mestizoes, or descendants of whites and Indians. 6. Mulattoes, or descendants of whites and negroes. 7. Zamboes, or descendants of negroes and Indians. The number of European Spaniards is only about 80,000, and that of

the negroes only 6 or 8000. The Creoles form about one-fifth of the whole population, the Indians two-fifths, and the mestizoes, mulattoes, and zamboes, nearly two-fifths. The northern provinces are very thinly settled. In 1803, 5,000,000 of the inhabitants, or about seven-eighths of the whole population, were concentrated within the torrid zone, on about one-third of the territory; and 4,000,000 of this number lived on the table-lands upon the ridge of the Cordillera. Nearly half the territory, as we have already seen, is quite unoccupied by civilized inhabitants.

395. The Indians and casts, who form nearly four-fifths of the population, are in the most degraded and oppressed state; and it is only since the revolution that the creoles have been permitted to take any share in the government and privileges vested in the small body of Europeans.

396. Face of the Country.—California is situated in the north-western part of the Mexican territory, lying between the Pacific Ocean and the internal provinces, and extending north to the boundary of the United States. The settlements are almost confined to the coast, so that a large portion of the interior is not only uninhabited but unexplored by the whites. It may be considered in fact as extending from the Rio Colorado to the Pacific, between twenty-three and forty-two degrees of north latitude. Its greatest length is 1300 miles, and its breadth 580; the area including about 400,000 square miles. The face of the country is very various. The peninsula, or Old California, is barren and sandy, traversed by a ridge of mountains which continue their course to the north-west. The coast of New California is bold, and the land gradually rises towards the interior into the table-land, on which the Chippewan mountains are based. The soil of New California is productive, and the climate in both parts of this province is fine; but it has scarcely a population of one person to sixteen square miles The internal provinces are situated east of California, in the same latitude, lying between this province and the territory of the United States, and stretching on the south to the Gulf of Mexico; the Vice-royalties, and the Pacific Ocean. They extend about 1000 miles from north-west to south-east, and 960 from north-east to south-west, the area being estimated at 960,000 square miles. The surface and soil are extremely various. The shores of the Gulf of Mexico and the Pacific Ocean are low, level, and sandy. The north-eastern section forms a part of the American Desert. The interior rises to the level of the table-land. The soil is generally dry and sandy, but there are many districts of great fertility; and the excellence of the climate, and the peculiar productiveness of the manioc and maize render it capable of sustaining a considerable population. But the great resource of this country is in its mines of gold and silver, which are numerous and rich.

397. The vice-royalty of Mexico lies south of the internal provinces, extending from twenty-four to sixteen degrees of north latitude, between the Pacific Ocean on the west, and the Gulf of Mexico and the Carribean Sea on the east. Its length from east to west is about 1100 miles, and its breadth from north to south 550, making its area about 300,000 square miles. The shores, like those of the preceding division, are low and sandy, but in many parts very productive. The interior forms the principal portion of the great table-land we have described so particularly. It is a country remarkable for its picturesque beauties and rich soil, as well as for the grandeur of its lofty peaks and volcanoes, and the richness of its mines: it has been for ages the seat of one of the richest empires of the world. We have already described the climate of this country, and it is only necessary to add, that, in consequence of the general elevation of the interior, more than three-fifths of that portion of New Spain which lies within the tropic, and which forms about one-third of the whole, enjoy rather a temperate than a hot climate, entirely free from the extremes and the diseases of the coast.

398. Productions.—A considerable part of the country situated to the north of the tropic is rendered barren by want of moisture; and in many parts also of the table-land within the tropics the plains are arid and destitute of wood. Still a great portion of New Spain belongs to the most fertile regions of the earth. On the banks of all the rivers, and wherever there is a supply of moisture, the fertility is extreme. The declivity of the Cordillera is exposed to humid winds and frequent fogs; and the vegetation, nourished by these aqueous vapours, exhibits an uncommon beauty and strength. The humidity of the coasts, assisted also by a burning sun, though it generates some terrible diseases, is favourable to the growth of the richest produce of tropical climates. The productions of this country are as various as its climate. In the course of a few hundred miles are to be found almost all the fruits of the temperate and torrid zones. The fertile regions on the coast produce, in abundance, sugar, indigo, and cotton. The banana also, which supplies the place of bread to the inhabitants of the torrid zone, and which is said to produce a greater quantity of nutritive substance than any other plant on the same space of ground, flourishes luxuriantly in all the low country. The same region in which the banana grows, produces also the manioc, which yields a very nutritious bread. But by far the most important agricultural production is maize. It grows in the low country, and on all the table-land except some of the highest plains, and the produce is most abundant, being in some places 800 fold, and on an average 150 fold. In the most warm and humid regions it will yield two or three harvests annually. Wheat, rye, and other European grain, have been successfully introduced in the northern provinces, and on the elevated plains within the tropics. All the garden vegetables and fruit-trees of Europe are now also possessed by the Mexicans. The central table-land produces in the greatest abundance cherries, prunes, peaches, apricots, figs, grapes, melons, apples, and pears. The vine and the olive would also flourish in this delightful climate; but, through the influence of the merchants in the mother-country, their cultivation has been prohibited, and the colo-

nists are still obliged to import their wine and oil from Old Spain. Tobacco is cultivated in some districts. One of the most valuable objects of husbandry is the cochineal insect, which is employed for dyeing scarlet, and is produced in considerable quantities.

399. MINES.—More than nine-tenths of all the silver in the known world is derived from the mines of Spanish America. Of this Mexico furnishes 22,000,000 of dollars annually. The mint of Mexico furnished from 1690 to 1803 more than 1,353,000,000 of dollars; and from the first discovery probably 2,028,000,000, or nearly two-fifths of the whole sent from America. Nearly half of this is procured from the three mining districts, Guanaxuato, Zacatecas, and Catorce, which form a central group of mines between 21° and 24° of latitude. The vein of Guanaxuato alone furnishes on an average one-sixth of the whole silver of America. 'The produce of the Mexican mines,' says Humboldt, who is our principal source of information on this subject, 'has tripled in fifty-two years, and sextupled in a hundred years; and it will admit of greater increase, as the country shall become more populous, and industry and information become more diffused.' The mines have hitherto been wrought in a manner calculated to render them far less productive and more expensive than they might be made. As British capital and British ingenuity are now occupied in endeavouring to improve their condition, we may expect in due season an increase still more important than has yet been known. But, notwithstanding the imperfection of the processes, and the want of steam-engines and suitable machinery, they have produced immense profits to their proprietors. 'The single mine of Valenciana, in which the expense of working exceeds four millions and a half of francs per annum, has for the last forty years never ceased to yield annually to the proprietors a net profit of more than three millions of francs; the profits sometimes amounted to six millions; and it amounted to twenty millions in the space of a few months, for the family of Fagoaga at Sombrerite'—*Humboldt*. In 1802 the mine produced 285,000 dollars. In nine years it yielded a net profit of 5,789,317 dollars. The expense of eight millions added to this gives in the gross product of thirteen millions. There were 1800 workmen employed in the interior of the mine, and three hundred men women and children without, making a total of 2100, at one dollar to half a dollar per day. The depth of the mine is 1640 feet, and it extends about eight miles in length.

400. According to Humboldt there are 3000 mines of the precious metals in Mexico at 450 stations. Their wealth consists more in the abundance than the richness of the ore. The consumption of mercury is very great, and the difficulty of procuring it is one obstacle to the progress of the mines. The great depth of many of the mines requires very expensive machinery; and in some places fuel could not be procured to work steam-engines. The most productive mines are situated at an elevation of from 5000 to 10,000 feet above the level of the sea. They are arranged by Humboldt in eight groups, which he estimates do not occupy a surface of more than 12,000 square leagues, or a tenth of the whole kingdom.

401. Gold is not peculiarly abundant in Mexico. While the annual export of silver amounts to twenty-two millions of dollars, that of gold does not exceed one million. The gold is chiefly extracted from alluvial grounds by washing. These grounds are common in Sonora in latitude 31°; lumps of five or six pounds' weight have been found, but the excessive price of provisions, and want of water, are great obstacles to the extraction of the metal. There are also veins of native gold in Oaxaca, and in Guanaxuato, Durango and Guadalaxara; it is also found in the silver ores. Platina has never been found north of the Isthmus of Panama.

402. Mercury, which is so essential in the working of the mines of silver, has been discovered in many parts of Mexico, especially in the provinces of Guanaxuato and Mexico. At St. Juan de Chiaa is a vein of cinnabar from six to eighteen feet in width, and its ores are extremely rich. It has only been wrought to the depth of 160 feet. The mine of Durasno produced in a very few months 700 quintals of mercury; but, from the want of intelligence and perseverance in working the mines of this rare and important metal, they were considered not worth attention; and only two were wrought during Humboldt's visit to the mining regions.

403. Copper is abundant in Mexico, and was the material used by the ancient Mexicans for cutting instruments in place of iron. Tin is found in grains in Guanaxuato and Zacatecas. Iron mines are found in considerable abundance in Valladolid, Zacatecas, and Guadalaxara; and are wrought with considerable spirit when the interruption of commerce shuts out foreign supplies. Lead is found in the north-eastern provinces. Zinc and arsenic are also among the minerals of New Spain. Humboldt concludes his account of these minerals by expressing the opinion, that 'the Mexican Cordilleras will one day supply the mercury, iron, copper, and lead, necessary for internal consumption.'

404. MANUFACTURES.—The whole value of the manufactures of Mexico was estimated by Humboldt at 1,500,000 dollars. They embrace cotton and woollen cloths, but chiefly those of a coarse texture, and conducted in a very imperfect manner. They were carried on usually by Indian workmen in a state closely resembling slavery. Silk is scarcely an article of manufacture; hemp and flax are not wrought at all, and even the manufacture of paper was unknown. Hard soap is a considerable article of domestic manufacture, in consequence of the abundance of soda found upon the table-land, and which will one day become an article of commerce with Europe. In 1802 there were sixteen manufactories of delf ware and two of glass. Hides are also manufactured to some extent.

405. The manufactures of tobacco and gunpowder are among the most extensive, and were formerly reserved as royal monopolies. The privilege, however, was by no means secured from violation, for much more of these articles

was annually consumed than the government produced. The manufacture produced a revenue of 800,000 dollars in 1802. The latter monopoly is maintained by the present government.

406. There are few countries in which a more considerable number of large pieces of plate are annually executed than in Mexico. The smallest towns have their work shops of silver; and services of plate, to the value of 6000 dollars, have been manufactured in Mexico, which rival the best productions of Europe in elegance of design and fine workmanship. The mint of Mexico is an immense manufactory of coin, which supplies the treasuries of Europe. The coinage of this single mint exceeded that of the sixteen in France, between 1726 and 1780, by nearly one half. Other articles of luxury are also made beautifully in this country. Even harpsichords and pianos are made in the internal provinces. The forests afford a great variety of beautiful woods; and the Indians display great ingenuity in forming them into articles of furniture and toys. Very handsome carriages are also made here, although the most elegant driven through the streets of Mexico, at the height of 9000 feet above the sea, are of London manufacture.

407. Commerce.—Mexico has a considerable internal commerce. The mining districts are continually exchanging their produce with the other provinces for provisions, and tools, and other supplies. The interior supplies the coast with bread stuffs; and receives foreign goods and the produce of the lower and warmer regions in return. The opposite coasts exchange the supplies which they receive respectively from Asia and Europe. The city of Mexico is the central mart of all the trade. The foreign commerce centers almost entirely in the two depôts for the East Indies and Europe, Acapulco, and Vera Cruz. It is much impeded for want of good harbours.

408. The eastern coast of New Spain, properly speaking, possesses no port; for Vera Cruz, through which the whole commerce is carried on, is merely a bad anchorage. The cause of this disadvantage is the gulf stream, which, in its passage along the shore, continually throws up the sands of the ocean, forming bars over which large vessels cannot pass. The sands thus heaped up by the stream are continually adding to the continent, and the ocean is everywhere retiring. These obstacles do not exist on the coast of the Pacific Ocean. San Francisco in New California, San Blas in the intendancy of Guadalaxara, near the mouth of the river Santiago, and especially Acapulco, are remarkably fine ports. A serious inconvenience, however, is common to the eastern coast and the coast of the Pacific Ocean—they are rendered inaccessible for several months of the year by violent tempests, which effectually prevent all navigation. The port of Acapulco is an immense basin cut in granite rock, and forming one of the most secure harbours, in which the largest ships lie almost touching the shore. It was chosen as the depôt for the trade between Spain and its possessions in the East Indies, and a galleon of 1200 or 1500 tons is annually despatched from them to this port laden with cottons, silks, jewelry, and spices; and returned with coin and iron to the amount of 1,500,000 dollars. Its arrival is the signal for the concourse of merchants from all parts of the country, and produces the chief fair of Mexico.

409. The commerce with Europe is carried almost entirely from Vera Cruz, although Tampico has recently become a place of resort for foreign ships. It is the eastern port for exporting the precious metals to other parts of the world, and the great mart for the disposal of manufactured goods. The trade, as calculated by Humboldt, was as follows:—

	Dollars.
Annual exports of gold and silver coin, bullion and plate	17,000,000
Cochineal	2,400,000
Sugar	1,300,000
Flour	300,000
Other articles	790,000
	21,790,000
Annual imports of bale goods, including woollens, cottons, linens and silks, to the value of	9,200,600
Paper	1,000,000
Brandy	1,000,000
Cacao	1,000,000
Quicksilver	650,000
Other articles	1,750,000
	14,600,000

410. Government.—The government of Mexico is now republican in its form; but the principles of its constitution do not seem to be finally established; and, in the present disturbed state of the country, it must be, to some extent, a military despotism. It is too feeble, or its agents are too corrupt, to repress the bands of robbers. The mass of the peasantry are nearly in the feudal state of vassalage, and the odious distinctions between the native Indians and whites, in taxation and privileges, do not seem to be abolished. Recent and authentic information leads us to believe that much must be done before a republican government can be administered in any degree of purity.

411. Revenue and Debt.—The revenues have of course been materially affected by the revolutionary state of the country. They are derived from the foreign customs, the monopoly of tobacco, an oppressive duty, called the Alcabala, paid on every removal of goods, and various excise duties and direct taxes. In 1823 the products of six months were only 6,418,814 dollars according to the official report of the ministry. The expenditures for the same period amounted to the same sum, including 2,800,000 employed in conducting the manufactories of tobacco and gunpowder. From the amount we have stated must be deducted the expense of the manufactories and the deficit, and we have the net amount of revenue only 3,500,000, or 7,000,000 per annum; of this, 200,000 was expended on the army, and 600,000 on the civil list. The revenue for 1808 under the old government was 20,000,000, and the expenditure

14,000,000, leaving a balance, remitted to Spain, of 6,000,000 dollars

412. The public debt was stated at 46,110,112 dollars, besides a sum of 26,000,000, due to Spain, which was supposed to be no longer binding upon them, after the opposition of the mother country to their emancipation, and the great revenue it had exacted.

413. Religion.—The established religion is the Roman Catholic, and no other is tolerated by law. The clergy are said to amount to 14,000, and form a powerful body. They are not distinguished for piety and morality; and their character has unhappily produced a very general disregard and disbelief of religion, which can scarcely endure the existing state of things. The Indians have no knowledge of religion, except as a collection of forms; and these they have been permitted to mingle with their pagan rites.

414. Education.—Education was formerly refused to the Indians and Mestizoes; and there are not now adequate means of improvement for those who desire it in most parts of the country. The university at Mexico was once highly respectable, and produced men of great learning. The people are in general grossly ignorant on all subjects; and no time has yet been afforded for the new government to adopt plans for general improvement. A society has been formed and patronized by the government for the introduction of the system of mutual instruction, and a school for 1600 children has been established in a convent in the capital, on this plan, intended to communicate not only the elementary, but the higher branches of knowledge.

415. Historical Sketch.—Fernando Cortez, a native of the town of Medellin in Old Spain, and a descendant of a noble but decayed family, was the discoverer and conqueror of Mexico. This celebrated adventurer was born in the year 1485, had studied at Salamanca, and was intended for the law; but his restless disposition caused him to abandon his profession and search for distinction in the romantic regions of the west. Proceeding to Hispaniola he joined Velasquez in an expedition to Cuba: here he was chosen to undertake a voyage of discovery to the coast of Mexico; and, having spent the greater part of his fortune in equipping his army and fleet, he set sail on the 10th of February, 1519, and steered for the isle of Cozumel, on which he landed, and then proceeded to the river Tabasco, where he forced the natives to acknowledge the Spanish king: from this place he sailed westward, and landed at the place now called St. Juan de Ulloa, where he debarked his men, horses, and guns, and erected a fortification.

416. The emperor of Mexico, hearing of the arrival of the Spanish ships at this place, sent two ambassadors to meet the strangers, to enquire their intentions, and to offer them assistance. Cortez returned a haughty answer, that 'he would confer with none but the emperor.' The Mexicans endeavoured to conciliate him by every means in their power. Alarmed by the unusual sound of cannon they heaped upon him the most costly presents, with the hope of inducing him not to march into the interior. The Spanish troops, who entertained fears of being attacked, broke out into mutiny: this was, however, soon quelled by the address of Cortez, who persuaded them besides to choose him commander and president of the new colony they were about forming. The town, thus commenced, received the name of La Villa Rica de la Vera Cruz. Not long afterwards another mutiny took place of a more serious character; but the influence of Cortez again prevailed, and he succeeded in inducing his men to adopt a decisive step which left them no alternative but conquest or utter ruin. This was the destruction of the fleet, a measure which left between five and six hundred persons without hope of escape, in the midst of the hostile inhabitants of a powerful and populous empire.

417. Having effected this important measure, Cortez, who had been joined by the cacique of Zempoalla with 600 men, marched on the 16th of August, having with him 500 of his own soldiers, with fifteen horses, and six cannon. With this force he entered the state of Tlascala, where he met with great opposition for fourteen days; but, after having beaten the Tlascalans at all points, he granted them peace, and they became afterwards his allies. He next advanced against Cholula, where he was treacherously received, and, to avenge himself, massacred 6000 of the natives. Proceeding onwards from this place they came in sight of the capital of the empire. At a short distance from the entrance into the city they were met by Montezuma at the head of his nobles, and surrounded by his guards and courtiers. Cortez dismounted from his horse and saluted the emperor with the utmost humility; and, after much ceremony, the emperor conducted him to a house prepared for his reception. No sooner had Cortez taken possession, than he fortified it in the strongest manner. Here he learned that the cause of their not having been attacked was a traditionary prophecy current among this people, that a powerful nation, children of the sun, would chastise the country for the punishment of their sins. Cortez readily turned the idea to his own advantage, and encouraged the awe which the Mexicans entertained for the Spaniards. Having under cover of the most friendly exterior made observations upon the city, he came to the determination of seizing Montezuma in his palace, and confining him in the Spanish quarters. He entered the palace with ten officers and soldiers, while a large party waited without. He addressed Montezuma; and, complaining of several things which he affected to dread, he requested the emperor would condescend to take up a temporary residence with the Spaniards. Montezuma reluctantly consented. He was at first treated with the attention and respect due to his station; but, after a short interval, Cortez came to his apartment with a soldier bearing fetters, and told him that the garrison at Villa Rica had been attacked; that he was the instigator of the insult; that he (Cortez) had ordered the guilty to be executed; and that the monarch himself must feel the weight of his anger. Turning fiercely to the soldier he commanded him to fetter the legs of Montezuma. The unfortunate

arch and his attendants were sunk in grief affliction, and Cortez left the room to at- at the execution of the sentence on the cul- . After this was ended, he repaired to the ror's chamber, and with his own hands off the shackles.

8. Montezuma remained a prisoner for six ths, during which period Cortez was em- d in reconnoitring the country, in preparing ild vessels on the lakes, and in dividing with oldiers the spoils of their conquest. Monte- now acknowledged himself, in form, a l of the Spanish king, and sent to Cortez his ts of homage executed in all the prescribed s, with a magnificent present accompanied thers from his subjects. In the mean time squez, the commander of the expedition in h Cortez had sailed to Cuba, hearing of his ess in Mexico, fitted out a fleet with a con- rable force of land soldiers, which he placed r the command of Narvaez, with instructions ize Cortez and his officers, and to take pos- ion of the empire in the name of Velasquez. tez, hearing of the arrival of this armament, ted Mexico, leaving a small force to guard ntezuma and his capital; and, having sent ies to many of the officers of Narvaez, attacked army by surprise, and gained a complete and ost bloodless victory. Hearing that his gar- n had been attacked in Mexico, he returned mediately, and entered the city without moles- ion; but was attacked in his fortress with at vigour. Having been twice wounded, and ced to retreat in the sallies made upon the siegers, he adopted the resolution of placing e emperor in view of his enraged subjects. ontezuma endeavoured to pacify them, but in in. The forlorn monarch was wounded by an row, and, disdaining the aid of the Spaniards, ied broken-hearted and despairing. After his ath, Cortez, finding that he could no longer aintain his position, quitted the town secretly, nd marched for the Tlascalan territories. Hav- ng recruited the spirits of his followers, and re- ived a reinforcement of 10,000 Indian allies, he again marched for Mexico exactly six months fter his evacuation of it.

419. Having fixed his head-quarters at Tez- cuco, on the banks of the lake, twenty miles from the capital, he built, with the assistance of the Indians of the place, thirteen small ships, which he launched on the lake. At this juncture four vessels, fitted out by his friends in Hispaniola, arrived with 200 infantry, eight horses, and sup- plies of arms and ammunition. He therefore im- mediately attacked the city on the east, west, and south. It was defended by Guatimozin, the new emperor, with undaunted courage, and Cortez himself was once taken prisoner; but fortunately rescued, though wounded in the attempt. His soldiers, who fell into the hands of the Mexicans, were sacrificed on the altars of the god of war. His allies, the Indians, now amounted to up- wards of 100,000, and his vessels obtained pos- session of the lakes Tezcuco and Chalco. The siege continued with vigour for seventy-five days, and the town capitulated on the 21st of August, 1521, when Guatimozin was taken prisoner; but Cortez stained the glory of his triumph by cruelly ordering the emperor to be put to the torture, in order to make him confess where he had hid his treasure; which, in fact, he had caused to be thrown into the lake. The remaining provinces of the Mexican empire yielded without much opposition to the Spanish conquerors.

420. Cortez now gave the country the name of New Spain. His proceedings were regarded with much jealousy at home, and an order was even issued for his arrest; but this was revoked, and he was appointed captain-general of New Spain. After adjusting the government, Cortez returned to Spain. Here he gained the affection of the emperor, who conferred on him the title of Marquisi del Valle de Guaxaca, together with the order of St. Jago, and the grant of a large dis- trict in New Spain. His unabated ardour for discovery and conquest, carried him again to America in 1530. His after-life was doomed to be embittered by disappointments. The Spanish government took from him the political govern- ment of New Spain, vesting it in an *audiencia real*, or royal audience, but leaving him the military command. In 1536 he fitted out some vessels, and discovered the Great Californian Gulf and part of its shores; and, after enduring incredible hardships, returned to Mexico. Here he met with a renewal of disappointment and oppression; and, for the purpose of obtaining justice, sailed for his native country, where he arrived in 1540, but obtained no redress. Mor- tification preyed upon his spirits, and this ex- traordinary man died in 1547, in the sixty-second year of his age.

421. The first viceroy of New Spain arrived in 1535. From this period to the year 1808, Mexico was governed by a succession of fifty viceroys, of whom only one was an American by birth, the Marquis De Casa Fuerte, a native of Peru. The annals of Mexico, from the conquest to the beginning of the present century, are re- markably devoid of interest. A series of restric- tive illiberal measures and oppressive exactions by the viceregal government, and especially the exclusive employment of Europeans in civil offices, excited great discontent among the Creoles. At length the revolutionary spirit of the provinces of South America was in some measure com- municated to Mexico.

422. After the occupation of Madrid by the French, and the abdication of the king in 1808, the viceroy of Mexico received such contradic- tory orders from the several authorities which claimed the control of Spain, that he proposed to call a junta of the country. This excited jea- lousy among the Europeans, who had hitherto been accustomed to the exclusive possession of power, and they seized the viceroy in his palace, sent him prisoner to Spain, and assumed the government. This act excited equal indignation among the Creoles or native Mexicans, and a conspiracy was formed by them against his suc- cessor. It was headed by Hidalgo, a priest of some talent, and enthusiastic in the cause of in- dependence. He collected a considerable force, and was proclaimed generalissimo on the 17th of September, 1810, and was received with shouts of joy by the Indians and Creoles. On the 27th of October he entered Toluca, a town

only twelve leagues west of the capital on his way thither. Some cause not ascertained led him to retire, and gave time for the royal forces to collect and pursue him with such vigour that he was completely defeated. He was ultimately taken and executed on the 20th of June 1811, together with some of his principal officers.

423. A junta had now been assembled as a provisional council for the revolutionists. Morelos, another priest, assumed the command in place of Hidalgo; and several provinces were completely occupied. Morelos next called a congress of forty members, who framed a constitution and proposed terms of peace to the viceroy, which were rejected with contempt. On the 5th of November 1815 Morelos was taken and shot. The congress, after removing from place to place, were dissolved by General Teran, who had succeeded to Morelos. In 1816 Mina, a nephew of the Spanish Guerilla chief, came to aid the revolutionists, and met with some success; but was ultimately defeated and met the fate of Hidalgo and Morelos. The war was maintained in an irregular manner, and with various success, until in February 1818 the congress was surprised, and the president taken prisoner. The form of government, however, was still maintained. In 1819 the war languished every where; the royalists had possession of the strong holds; the armies were at length disbanded; and the chiefs dispersed or retired to the mountains to wait a more favourable period. The termination of this revolution is principally to be attributed to the opposition of the clergy.

424. The revolution in Spain, which introduced the cortes and the decrees for confiscating the church estates and reducing the number of the clergy, excited alarm in the same powerful body in Mexico, and they at once proclaimed from the pulpit that the interests of religion required the independence of Mexico. They united with the Europeans in selecting Don Augustin Iturbide, a Creole, but a zealous royalist and in command of the army, as the instrument for the execution of their plans. He soon formed a junction with the patriots; and after having despatched emissaries to every part of the kingdom to prepare the people, he advanced to Iguala; and on the 24th February 1822 proposed to the chiefs the plan of Iguala, which was immediately adopted, and transmitted to every part of the kingdom. This plan provided,—first, for the preservation of the catholic religion and rights of the clergy; secondly, for the union of Europeans and Creoles; thirdly, for the independence of Mexico; fourthly, for a limited monarchy under Ferdinand, or one of his family. This plan, by no means the choice of any party, was yet received as a compromise by all; and the revolution was effected every where without bloodshed, and almost without a struggle.

425. At this moment General O'Donojou arrived at Vera Cruz, with the appointment of captain general; but finding the country so completely in the possession of the revolutionists, he made a treaty with Iturbide grounded on the plan of Iguala, and withdrew the royal forces from the capitol. A junta of thirty-six members was now appointed, and they chose a regency of five persons, with Iturbide as president, to exercise the executive power. From this moment Iturbide, who had hitherto affected great moderation, made every effort to obtain absolute power. On the 24th of February 1822 a cortes elected according to the direction of the junta was assembled; they were soon divided into three parties, the Bourbonists, the republicans, and the partisans of Iturbide, who sought to profit by their dissensions to give him the supreme power. Frequent contests occurred between the parties and the regency, and at length were brought to a crisis by the refusal of the cortes to raise the troops required by Iturbide. On the 18th of May his friends assembled and harangued the soldiers, and distributed money among them; and at ten o'clock at night they proceeded to Iturbide's house, and proclaimed him emperor under the name of Augustine the First. In the morning, on the assembling of the cortes, they found themselves surrounded by an insulting soldiery and an enthuiastic mob, who threatened them with death if they did not immediately ratify their choice. This was accordingly done. Iturbide now made urgent demands for an increase of power, for a control over the judges, and many other arrangements which the cortes absolutely refused. On the 26th of August he arrested fourteen of the most active of his opponents, and kept them in confinement without allowing them to be brought to trial. His views were still thwarted, and at length he sent an officer to dissolve the cortes, and expel them by force from their chamber.

426. The Emperor now called a junta of members appointed by himself, who assembled to the number of forty-five on the 2d of November, obviously as the mere organ for the expression of the imperial will. An insurrection, however, had broken out in the northern provinces in the month of October. Santana, who was in command at Vera Cruz, in consequence of receiving a dismission, induced his troops to revolt and proclaim a republican government. Guadalupe Victoria, an early hero of the revolution, joined him; and the party was soon after strengthened by the addition of other generals of the imperial troops. This was the signal for general revolt The emperor was called upon to abdicate, and at length, on the 8th of March, he called together some members of the old cortes, and tendered his resignation. The members declined receiving any abdication, as this would imply his right to the throne; but advised that he be permitted to leave the country with a pension; and he was accordingly escorted to the coast, and embarked for Leghorn on the 11th of May 1823.

427. On the 27th of March the republican army entered the capital. The old congress was immediately convoked; a provisional government appointed, with an executive of three members; a new congress was called, who framed a constitution since adopted. A federal government was established, and sworn to in the capital on the 24th of February 1824. The provinces next proceeded to organize state governments with every appearance of harmony.

428. Some disturbances arose subsequently,

from the ambitious designs of some of the superior officers, but were quelled without serious difficulty. Iturbide was afterwards induced by his friends to return, but was discovered under a disguise, and was immediately arrested and shot. The great difficulties under which the new government now labours, arise from the distracted state of the finances, and the exhausted condition of the country. Emissions of paper and forced loans were the only sources of supply for some time, and the credit of the government had become very low; but as these measures were abandoned it was again rising, and the loans obtained from British merchants promised to re-establish the finances and give time for the country to recover. The great dangers to be apprehended are—on the one hand from the influence and intrigues of the priests, who dread the improvement of the people, and are opposed to civil liberty; and on the other, from the degraded and oppressed Indians and casts, who form the majority of the population. The improvement of the condition of this part of the population was pronounced some years ago, as indispensable in order to secure the tranquillity of the country, even under the despotic rule of Spain.

429. GUATIMALA.—The southern portion of the Mexican provinces, formerly entitled the Captain Generalship of Gutatimala, has recently been erected into an independent republic, under the name of the Central States of America, with a constitution nearly resembling that of the United States. Its former division were Chiapa, Vera Paz, Guatimala, Honduras, Nicaragua, and Costa Rica. The country was about 1000 miles in length from north-west to south-east. The settled parts lie chiefly on the coast of the Pacific. It is crossed by the ridge of the Cordillera, which in this part abounds with volcanoes. About twenty are in an active state. The lake of Nicaragua is in this region.

430. The soil is represented as extremely fertile, and the productions are similiar to those of Mexico. Grain, cotton, cochineal, wax, honey, dye-woods, and indigo of superior quality are the principal articles. The province of Honduras is particularly celebrated for logwood and mahogany; and the English have a settlement in it for the purpose of carrying on this trade. The farming districts furnish cattle, sheep, and wool in abundance. Guatimala contains few mines. The state of agriculture is better than in most of the other Spanish colonies, and the country more populous. In some parts three crops of maize are raised in a year. The climate is in some districts agreeable; in others hot and unhealthy, varying like that of Mexico with the elevation of the ground. The population is estimated at 1,800,000, of which a considerable part are Indians.

INDIANS.

INDEPENDENT TRIBES OF NORTH AMERICA.

CHAP. V.

431. Only three centuries ago the whole of North America was a dreary wilderness, occupied by the native tribes of Indians. Extensive tracts are now inhabited by civilized nations. The numerous tribes once found on the eastern coast have gradually diminished as the white population increased, and many have become extinct; destroyed in part by the new diseases which they took from the whites, and still more, perhaps, by the habits of intoxication they learned. But a large part of this extensive division of the world, is still occupied by savage tribes, although nominally included within civilized governments. They have almost exclusive possession of all the territory north of thirty degrees of latitude, except the portion of the United States east of the Mississippi, and the British province south of latitude fifty degrees, or of the territory extending from the northen shores of the continent to latitude fifty on the eastern coast, and to latitude thirty degress west of the great river Mississippi.

432. The northern and north-eastern coasts are inhabited entirely by the Esquimaux, who derive their subsistence chiefly from the sea. They resemble the Samoiedes of Asia in appearance; and, like them, are dull in intellect, mild in their disposition, and filthy in their habits. They do not appear to be regularly organized in tribes. The Moravians have established several missionary stations among them, and find them very docile.

433. All the natives of this continent belong to a single and peculiar race, except the Esquimaux; and throughout its vast extent of country and variety of climates they preserve the same characteristics. They have a copper colour resembling that of rusty iron or cinnamon; coarse, straight, black hair; high cheek bones, and sullen eyes. The forehead is usually short, the nose and the whole countenance broad, the nostrils very open, and the lips thick. The beard is thin and scanty. It has been said that the Indians were destitute of beards; but it is well ascertained that this is not the case naturally, and that they take great pains to pluck them out. Some of the American race have a lighter colour than others. Thus Cook states that the natives around Nootka Sound are little inferior in fairness to Europeans; and the same observation is made concerning the Peruvians, that these variations do not appear to arise from situation, as they do not correspond to the difference of climate.

434. Most of the Indians of North America are formed into distinct tribes. Those now remaining in the United States are really independent communities, being allowed to hold their

lands, and continue under their own government and laws, so far as they do not interfere with the laws of the Union. At the original settlement of the country the right of soil, which to the Indians had only the value of a hunting ground, was purchased in several of the provinces. The only right now claimed by the government of the United States is the sovereignty of the soil, and the right of pre-emption of all lands sold by the Indians. Most of the tribes receive frequent presents, and many of them an annual stipend from the government, of blankets, muskets, gunpowder, and other articles of necessity, and the authority of the chiefs is recognised by investing them with medals. The interior of North America, from the borders of the Esquimaux to the St. Lawrence and the great lakes, is occupied chiefly by the various tribes of the Knisteneaux and Chippewayans. The Knisteneaux are the most intelligent, mild, and honest. These tribes inhabit the northern part of Missouri Territory, and extend as far east as Lake Michigan. There are two or three missionary stations among them; and a few small communities are partially civilized.

435. The principal tribes between the St. Lawrence and the Potomac, were the Mohekanneews, or Mohegans, and the Iroquois, or Six Nations. A few of the Mohekanneews still remain scattered through New England and its islands; and about 5,000, chiefly Iroquois, reside in the western part of the State of New York. Some of these have become civilized and Christian, from the instructions of missionaries and the agents of government. Among these were several tribes on the island of Martha's Vineyard, and there are still considerable numbers remaining; but almost destitute of religious instruction. The most important tribes in the United States are those living between the Tennessee River and the Gulf of Mexico; the Cherokees, Chichasaws, Choctaws and Creeks, amounting to 60,000. Those nations have acquired most of the arts of civilized life; and many cannot be distinguished from the whites with whom they have intermarried; but they still retain their former government and many of their customs. They are friendly to our government, which has united with missionary societies in sending teachers and mechanics to give them instruction in Christianity and the arts of civilization. Even now there are many among them who are well educated, and possess large estates with numerous slaves. The Seminoles formerly belonged to the Creeks, but are said not to have so good a character. In the Arkansaw territory several powerful tribes are found, who use horses taken from the immense herds which are found wild in that region.

436. The nations best known in the Missouri territory are the Sioux, the Pawnees, the Ricarees, and the Osages. They are remarkably tall, robust, and ferocious, and fond of war. Their country abounds with animals, furnishing excellent skins and furs, which they sell to the whites. Several missionary stations are established among hese tribes, with favourable prospects; and one among those Cherokees who removed from their former residence to the Arkansaw territory a few years since. The Snake Indians are a mild inoffensive race living among the rocky mountains, who are much oppressed by those around them. The tribes west of the Rocky Mountains are very little known. Many of them are called flat-head Indians, from the flatness of their skulls, produced by pressing their heads in infancy. It is supposed that there are 150,000 Indians between the Mississippi and the Rocky Mountains; and about the same number beyond these mountains; all of which are in a savage state, ignorant of Christianity, and sunk in vice. There are probably 100,000 east of the Mississippi, (making 400,000 in the whole,) most of whom are in the same condition.

437. The number of Indians in the British provinces is not well ascertained. Their condition does not seem to be so secure as in the United States. The tribes which originally possessed the provinces of Nova Scotia, and are united by treaty with the government, are now mere wanderers. They possess no land, they receive no stipend from the government, nor are they the objects of its care in any respect. They are even left without adequate protection from the oppression of individuals. Even their burying-grounds have been taken from them by individuals, and their attempts to settle and cultivate the ground have more than once been thwarted by the seizure and appropriation of their improvements by the whites.

438. The Indians of Mexico form two-fifths of the whole population, but are kept in a state of entire dependence, and of subjection strongly resembling slavery. They are confined to villages in which whites are not permitted to reside; are allowed to possess no private property; and are rendered incapable of entering into a contract. The casts are kept in a state of degradation by an impost called the tribute, and other restrictions, merely on the ground of the mixture of blood; and by leading them into debt many are made almost perpetual slaves to those possessed of capital.

439. The Indios Bravos, or independent tribes of the north, are considerably numerous, and maintain a state of perpetual war with the whites. When taken prisoners they are usually made slaves. They are vastly superior to the subdued Indians in character and energy. The only important difference between them and the Indians of the missions in Mexico, consists in the subjugation and confinement of the subdued to a single spot, their acquaintance with some of the arts of civilization, and their making the sign of the cross, and performing the other external rites of the catholic religion.

440. The Indians of North America are generally distinguished for boldness, activity, and patience under fatigue and suffering. They are usually grave and hospitable in their disposition; and a remarkable degree of native intelligence and eloquence is found among their chiefs and warriors. The Indians of Mexico have a milder character and less energy than those of the northern tribes. The subdued Indians have the feebleness and degradation of slavery.

441. American Languages.—The languages of America are known but imperfectly, and

there is a great variety of opinions concerning them. In North America, east of the Mississippi river, all known languages are traced by the latest authors to three or four great branches. 1st. The Karalit, or Esquimaux, is spoken by the Indians of this name on the northern and north-eastern coasts. It has been found to be the same with that of the Tschutkis, or eastern Siberians. 2d. The Delaware, sometimes called Mohegan and Algonkin, is the most widely diffused. It prevailed among all the ancient tribes of New England, and those north of the Ohio River, and the lakes, and as far west as the Rocky Mountains. Dialects of this language are still spoken by the Chippeways, Shawnees, Ottawas, Winnebagoes. 3d. The Iroquois is a distinct language, remarkable for wanting all labials, and therefore sonorous. 4th. The Floridian family, according to Heckewelder, is a distinct branch, embracing all the dialects on the Gulf of Mexico.

442. West of the Mississippi there are many languages not well known. Among these are the Sioux and the Pawnee in the north; and in the south a great variety.

443. Mexico is said to have more than twenty languages, many of which are as distinct from each other as the Greek, the German, and the French. Fourteen have grammars and dictionaries. The Aztec, or ancient Mexican, is the most prevalent. On the coast of California no less than seventeen languages are spoken.

444. The Carribee is the native language of the northern parts of South America, and was that of the West India Islands. The language of the Incas, which is called the Quichua, prevails in Peru and the neighbouring districts. It is described by a native of that country as abounding in vowels, and peculiarly soft in its sounds.

445. The Araucanian of Chili is also described as a distinct language, remarkably rich and harmonious.

446. The character of the American languages is by no means such as we should expect among barbarous nations. Some resemblance has been found to Asiatic dialects; but their origin and connections have not been fully investigated. Although they were never written by the Indians, they are remarkably artificial and complicated in their structure. Some of them are almost destitute of the irregularities found in the languages of the civilized world. Words are easily combined so as to express every shade of meaning with exactness, and the Chilese is said to be far more precise than European languages. There is such a variety of words to express a single idea that, without a full examination, they would be considered as belonging to a different language, and hence the variation of dialects is much less than at first appears. Some, like the Mexican and Chilese, are distinguished for their copiousness in abstract terms; so as to render them peculiarly suitable for discussions. They are remarkable for the length of their words, and are generally sonorous and agreeable in their pronunciation. A distinguished scholar, who has investigated these languages, declares himself 'lost in astonishment' at the copiousness and singular structure of these languages. Notwithstanding the regular form of their languages, no native people of this continent had devised an alphabet; and other methods were used for recording events. The Indians of South America at an early period used knotted cords, called quipo, as a record; and the North American Indians were accustomed to deliver a belt of wampum, as the memorandum of each portion of a speech or message.

447. The most perfect means of recording events among the natives of America, was the picture-writing of the Mexicans. It was a mixture of paintings and hieroglyphical emblems, and was the only means of communicating information to a distance. The Indians of the United States convey intelligence by drawings and symbols of the same nature, but executed in a very rude manner.

PART II.—SOUTH AMERICA.

CHAP. I.

GENERAL PHYSICAL DESCRIPTION.

1. South America, connected with North America by the Isthmus of Darien, lies between north lat. 12° 30′; and south latitude 55° 30′; and between 35° and 81° west long. It is bounded on the north by the Carribean Sea, the Atlantic Ocean, and the isthmus already named; east and south by the Atlantic; and on the west by the Pacific Ocean. Its greatest length from north to south is 4570 miles; and its greatest breadth 3320, including a superficial area of about 7,010,500 square miles.

2. We shall divide our observations upon this stupendous portion of the continent into two parts: the first, including a general physical description, or its great geographical divisions and features; and the second, the more circumscribed geography and extent of its civil divisions, together with its politics, and a sketch of its intellectual and moral state.

3. The New World is not more distinguishable from the other regions of the globe by its position and extraordinary magnitude, than by the majesty and sublimity of its geographical features—all to be traced, in their full extent, in this southern portion. Its stupendous mountains which bulge above the clouds, and are piled

one above another like the fabled pillars of heaven—its wide-stretching plateaux—its almost immeasurable savannas—and its mighty rivers, rolling their majestic waters over the plains to the ocean, impress the mind with sensations of awe and astonishment. Placed amid the summits of its Andes, the European traveller seems as if lifted into a new horizon, and surrounded by the ruined fragments of a superior world. The impressive scenery of America, in this respect, is nevertheless deficient in some of those features which augment the beauty and sublimity of other mountainous regions. The magnificent glaciers, which in the Alpine districts of Europe add majesty to horror, and the terrible avalanches, so awfully grand and destructive, are unknown in the torrid zone. But the tremendous chasms and cataracts have excited the astonishment of every beholder.

4. The Andes are the most magnificent mountains in South America; and, indeed, all the other mountains of any considerable importance are considered by some writers as different branches and ramifications of these. We suppose the range which runs along the eastern coast to be an exception to this statement. The main chain of the Andes, running along the western coast, extends on both sides of the equator to near the thirtieth degree of latitude, it is of unequal height, sinking in some parts to 600 feet from the level of the sea, and, at certain points, towering to an elevation of almost four miles. The colossal Chimborazo lifts its snowy head to an altitude which would equal that of the Peak of Teneriffe placed on the top of Mount Etna. The medium height of the chain under the equator may be reckoned at 14,000 feet, while that of the Alps and Pyrenees hardly exceeds 8000. Its breadth is proportionably great, being sixty miles at Quito, and 150 or 200 at Mexico and some districts of the Peruvian territory. This stupendous ridge, intersected in Peru and New Granada by frequent clefts, or ravines, of amazing depth, softens down by degrees to the north of the Isthmus of Panama, and spreads out into the vast and elevated plain of Mexico. In the former provinces the inhabitants are obliged to travel on horseback or on foot, and in some cases to be carried on the backs of Indians; whereas carriages drive with ease through the whole extent of New Spain, from Mexico to Santa Fé, along a road of more than 15,00 miles. The equatorial regions of America exhibit the same composition of rock that we meet with in other parts of the globe. The only formations which Humboldt could not discover in his travels were those of chalk, roe-stone, gray wakke, the topaz-rock of Werner, and the compound of serpentine with granular limestone which occurs in Asia Minor. Granite, in South America, constitutes the great basis which supports the other formations; above it lies gneiss; next comes micaceous schist, and then primitive schist. Granular limestone, chlorite schist, and primitive trap, often form subordinate beds in the gneiss and micaceous schist, which is very abundant, and sometimes alternates with serpentine and sienite. The high ridge of the Andes is everywhere covered with formations of porphyry, basalt, phonolite, and green-stone; and these, being often divided into columns, that appear from a distance like ruined castles, produce a very striking and picturesque effect. At the bottom of these huge mountains occur two different kinds of limestone; the one with a silicious base, enclosing primitive masses, and sometimes cinnabar and coal; the other with a calcareous base, and cementing secondary rocks together.

5. Plains of more than 600,000 square miles are covered with an ancient deposit of limestone, containing fossil wood and brown iron ore; on this rests the limestone of the Higher Alps, presenting marine petrifactions at a vast elevation. Next appears a lamellar gypsum, impregnated with sulphur and salt; and, still higher, another calcareous formation, whitish and homogeneous, but sometimes cavernous. Again occurs calcareous sand-stone, then lamellar gypsum mixed with clay; and the series terminates with calcareous masses, involving flints and hornstone. But what may perplex some geologists, is the singular fact noticed by Humboldt, that the secondary formations in the New World have a most enormous thickness and elevation. Beds of coal are found in the neighbourhood of Santa Fé, 8650 feet above the level of the sea; and even at the height of 14,700, near Huanuco in Peru. The plains of Bogota are covered with sand-stone, gypsum, shell-limestone, and, in some parts, with rock-salt. Fossil shells, which in the old continent, have not been discovered higher than the summits of the Pyrenees, or 11,700 feet above the sea, were observed in Peru, near Micuipampa, at the height of 12,800 and again at that of 14,120; besides at Huancavelica, where sand-stone also appears. The basalt of Pichincha, near the city of Quito, has a elevation of 15,500 feet; while the top of the Schneekoppe, in Silesia, is only 4225 feet above the sea, the highest point in Germany where that species of rock occurs. On the other hand granite, which in Europe crowns the loftier mountains, is not found in the American continent above the height of 11,500 feet. It is scarcely known at all in the provinces of Quito and Peru. The frozen summits of Chimborazo, Cayambe, and Antisana, consist entirely of porphyry; which, on the flanks of the Andes, forms a mass of ten or twelve thousand feet in depth. The sand-stone near Cuença has a thickness of 5000 feet; and the stupendous mass of primitive quartz, on the west of Caxamarca, measures, perpendicularly, 9600 feet. It is likewise a remarkable fact, that the porphyry of those mountains very frequently contains hornblende, but never quartz, and seldom mica.

6. The Andes of Chili have a distinct nature from those three chains called the Maritime mountains, which have been successively formed by the waters of the ocean. This great interior structure appears to be coeval with the creation of the world. It rises abruptly, and forms with a small angle with its base; its general shape being that of a pyramid, crowned at intervals with conical, and, as it were, crystallized elevations. It is composed of primitive rocks, as quartz, of an enormous size and almost uniform configuration, containing no marine substances

which abound in the secondary mountains. From the Cordillera of this part of the Andes, are obtained blocks of crystal, of a size sufficient for columns of six or seven feet in length. The central Andes are rich beyond conception in all the metals, lead only excepted. One of the most curious ores found in the bowels of those mountains is the pacos, a compound of clay, oxyde of iron, and muriate of silver, with native silver. The mines of Mexico and Peru, hitherto worked with remarkable success, so far from being exhausted, promise, under a liberal and improved system, to become more productive than ever. Nature has, however, blended with those hidden treasures the active aliments of destruction. The whole chain of the Andes is subject to the most terrible earthquakes. From Cotopaxi to the South Sea, no fewer than forty volcanoes are constantly burning; some of them, especially the lower ones, ejecting lava, and others the muriate of ammonia, scorified basalt, and porphyry, enormous quantities of water and moya, or clay mixed with sulphur and carbonaceous matter. Eternal snow invests their sides, and forms a barrier to the animal and vegetable kingdoms. Near that confine the torpor of vegetation is marked by dreary wastes; and in these wild solitudes the condor, a fierce and powerful bird of prey, fixes its gloomy abode.

7. The appellation Chimborazo, a mountain in the Paramo, or desert of Riobamba, in the kingdom of Quito, signifies, mountain 'of the other side.' It is the loftiest in the world, situate, according to the observations of M. de la Condamine, in 1° 21′ 18″ south latitude. Its sides are covered with a kind of white sand, or calcined earth, with loose stones, on which grows a certain herb called pajon, which affords pasture for cattle. The warm streams flowing from its north side seem to warrant the idea that within it is a volcano. From its summit flow the Guaranda running south, the Guano south-east, and the Machala east. On its skirt lies the road which leads from Quito to Guayaquil; in order to pass which, with safety, it is requisite to be cautious in choosing the proper season. Many Spanish conquerors of this province were here frozen to death. On the 23d of June, 1797, this mountain was visited by Humboldt, who, with his party, reached its east slope on that day, and planted their instruments on a narrow ledge of porphyritic rock which projected from the vast field of unfathomed snow. A chasm, 500 feet wide, prevented their further ascent. The air, reduced to half its usual density, was intensely cold and piercing. Respiration was difficult, and blood oozed from their eyes, lips, and gums. They stood on the highest spot ever trod by man. Its height, as ascertained from barometrical observation, was 3485 feet greater than the elevation attained, in 1745, by Condamine, and 19,300 feet above the level of the sea. From that extreme station the top of Chimborazo was calculated at 2140 feet still higher. In Quito is also the mountain desert of Cotopaxi, in the province of Tacunja, in 4° 11′ south latitude. It is of the figure of an inverted truncated cone, and was discovered, in 1802, to be only 260 feet lower than the crater of Antisana, which is 19,150 feet above the level of the sea. On its snowy summit is a volcano which burst forth in 1698 in a dreadful manner, and destroyed the city of Taconja, with three-fourths of its inhabitants, together with several other settlements. A river of mud, which it vomited up, so altered the face of the province, that the missionaries of the Jesuits of Maynos, seeing carcases, pieces of furniture, and houses, floating down the Maragnon, were persuaded among themselves that the Almighty had visited this kingdom with some signal destruction; and, therefore, wrote circular letters to ascertain what number of persons were remaining alive. Similar phenomena were experienced in the years 1742, 1743, 1766, and 1768. From the east part of this mountain the Napo takes its rise; and from the south the Alagues, the Cotouche, and several other rivers.

8. The celebrated mountain of Potosi, in the twenty-sixth degree of latitude, has on its skirts the city of its name. This mountain is well known throughout the world for the immense riches extracted from its inexhaustible mines of silver. The distinguishing feature of the mountains of Chili, especially that of Copiapo, is, that they consist, in a great degree, of petrified teeth, or bones of animals, coloured by metallic vapours. Copiapo, according to the Indian tradition, owes its name to, and is indicative of, this circumstance. The turquoises, or stones, found on its mountains are usually of a greenish blue, and very hard, being known by the name of the turquoises of the old rock. Some authors describe the mountain as consisting of marble, striped with various coloured bands of a beautiful appearance.

9. appears to be a general principle in these mountains that they are highest at the equator; and that they decrease, in a gradual ratio, as they are distant from the lofty chains of the Andes. The following table exhibits the comparative height of the most remarkable mountains in South America, in relation to those of some other parts of the world.

	Feet above the level of the Sea.
Chimborazo, the highest peak of the Andes	21,440
The highest part upon this mountain ever trodden by man	19,100
Cajambe	19,480
Antisana (volcanic)	19,150
Farm-house on the above (the highest inhabited place on the globe)	13,500
Cotopaxi (volcanic)	18,898
Illinissa	17,238
Nevada de Santa Marta	16,490
Catocatche	16,450
Tunguaragua (volcanic)	16,270
Nevada de Merida	15,201
Pambomarca	13,500
Imbabura (volcanic, which frequently throws up fish)	8,960
In Europe, and other parts of the World.	
Peak of Teneriffe	15,396
Mount Blanc	15,243
——— Etna	12,000
Gemmi, in Switzerland	10,110

	Feet above the level of the sea.
Buet	9,945
Granacion	8,874
Blue Mountains, in Jamaica . . .	7,483
Table of Good Hope Cape	3,585

10. But America is, perhaps, not more remarkable for the stupendous magnitude of its mountains than for the vast elevation of its plains. The highest cultivated land in Europe is seldom more than 2000 feet above the level of the sea; whilst a great portion of the table-land in America lies at the enormous height of from 6000 to 10,000. Many of the extensive plains of Peru are near 10,000 feet in elevation. Other wide plains, almost interminable, stretch through the regions of this amazing continent, at a slight elevation above the level of the sea, as exemplified in those of Orinoco, Amazonia, and Buenos Ayres. These consist, for the most part, of extensive savannas, occasionally diversified with clumps and palms. Of these lofty regions the province of Quito is the most remarkable, which enjoys a delightful climate, and supports an immense population. Extensive towns have been erected on this celebrated spot. That of Quito is 9,639 feet in altitude, and the people, who reside secluded from the rest of the world, gradually forget that, the towns crowded with inhabitants—the pastures covered with flocks—the fields waving with luxuriant harvests, and every other surrounding object, hang suspended in the upper regions of the atmosphere, at the elevation of 9,600 feet above the level of the sea.

11. As the mountains of America are so much superior to those of the other divisions of the globe, so are the rivers of much greater magnitude and importance. The Magdalena rushes into the ocean with such a volume of waters, that it holds itself independent of the Atlantic to a distance of at least twenty leagues from its disemboguement, and as far as this the water is perfectly pure and sweet to drink. The mouth of this river is about sixty-three miles to the north-east of Carthagena, 11° 2′ north latitude, and was discovered in 1525 by Rodrigo Bastidas, on the day of St. Mary Magdalen, and first navigated in 1531. It rises in the province of Popayan, from two fountains found in the mountains to the west of Timana, through which it passes; it then traverses and irrigates the province and government of Neiba; and following its course from south to north runs upwards of 300 leagues before it enters the sea, receiving the waters of many other rivers; some of which, as the Cauca, Cesar or Pompatao, Carari, Macates, De la Miel, Zarate, and others, are of considerable magnitude. It is navigable from its mouth as far as the town and port of Honda, a distance of 160 leagues. Its shores are covered with thick woods, in which dwell some barbarian Indians, who are ferocious and treacherous. Immense tigers are found here; and the river swarms with an incredible number of alligators, as well as with every kind of fish. By this river you pass to the kingdom of New Granada, and on it a great traffic is carried on by means of large flat-bottomed boats, here called champanes; but the navigation is rendered unpleasant on account of the great number of musquitoes with which it is infested.

12. The Maragnon is the largest known river, not only in America, but in the whole world. It is said to rise from the lake Lauricocha, in the province of Tarma, in Peru, 10° 29′ south latitude; but its most remote source is the river Beni, which rises in the Cordillera De Acama, about thirty-five miles from La Paz, in the province of Sicasica. It runs from north to south as far as the province of Yaguarsongo, in the kingdom of Quito, whence it forms the strait of Guaracayo, and follows its course from west to east, running a distance of 1800 leagues. The mouth or entrance of this river is about 180 miles wide; the tide-water ends at Obidos, about 400 miles from its mouth, where the river is 905 fathoms wide. The violence with which this river flows is so great that it repels the waters of the ocean, and retains its own stream pure and unimpregnated for a distance of eighty leagues in the sea; a circumstance the more wonderful, inasmuch as from the above distance of Obidos to its mouth, 400 miles, it has a fall of only four feet. Innumerable are the rivers which it receives in its long-extended course. The first who discovered the mouth of this immense river, was Vincente Yanez Pinzon, in 1498. It was afterwards reconnoitred in 1541 by Francisco de Orellano, lieutenant of Gonzalo Pizarro; in 1560 by Pedro de Ursua, by order of Don Andres Hurtado de Mendoza, marquis of Canete, viceroy of Peru; in 1602 by the father Rafael Ferrer, of the abolished order of Jesuits of the province of Quito, and missionary amongst the Cofanes Indians; and in 1616 by order of Don Francisco de Borja, prince of Esquilache, viceroy of Peru; also in 1725 by Juan de Palacois, in company with fathers Domingo Breda and Andres de Toledo, of the order of San Francisco. Besides these, Pedro Texeria, a Portuguese, undertook, in the name of Santiago Raimundo de Norona, governor of San Luis de Maranham, the further navigation of this river, arriving by the Napo as far as the port of Payamino, in the province of Moxos. In 1639 Don Geronimo Fernandez de Cabrera, count of Chinchon, and viceroy of Peru, sent as far as Paru, the fathers Christoval de Acuna and Andres de Artieda, Jesuits of the province of Quito, and also the father Samuel Fritz, a German, and of the same extinguished company, a great missionary and profound mathematician. He it was that took the most exact observations as far as Paru, in his voyage made in the years 1689 and 1691, and who gave to the world the first geographical chart of the Maragnon, made and published in Quito in 1707. Another map was afterwards published by Don Carlos de la Condamine, of the royal academy of sciences at Paris, he being one of the persons commissioned to make astronomical observations under the equinoctial line. This last map is the most correct, and was made in the voyages he took in the Maragnon in the years 1743 and 1744, although it was much amended and enlarged by another map which had been formed by the father Juan Magnin, of the aforesaid company, and then missionary of the city

of Borja, of the province of Mainas, and an honorary academician of the sciences at Paris. See AMAZONS RIVER.

13. The Orinoco rises in latitude 5° north, and longitude 65° west; its course is very crooked, somewhat resembling the figure 6. For the first 300 miles it runs from north to south. It then turns and proceeds for several hundred miles in a westerly direction. At St. Fernando it receives the Guaviari, a considerable river from the south-west. Turning northward it receives the Vichade from the west, and precipitates its waters down the cataracts of Atures 740 miles from the mouth of this river, and 760 from its source. About 90 miles below the cataracts the river is enlarged by the junction of the Meta, which is 500 miles long, and navigable 370 miles; and about 90 miles from the mouth of this river, the Orinoco receives from the west the river Apure, a large river 520 miles long, having numerous branches and more rapids than the Orinoco itself, into which by many mouths it disembogues its waters. After receiving the Apure it turns, and, running about 400 miles in an easterly direction, divides itself into many branches, and empties its waters into the ocean opposite the island of Trinidad by fifty mouths, the two most distant of which are 180 miles apart: seven of them are navigable; and the southern one, called the Ship's Mouth, for vessels of more than 200 tons. The various islands formed by the mouths of the Orinoco, called the Orotomecas or Palomas, are inhabited by a barbarous race of Indians of the same name.

14. The Orinoco bears the name of Iscarite until it passes through the country of the Tames Indians and acquires the name of that district, which it changes at passing through the settlement of San Juan de Yeima into that of Guayare, and then to that of Barragan just below where it is entered by the Meta. The Orinoco is navigable for more than 200 leagues for large vessels, and for canoes as far as Tunja, or San Juan de los Llanos. Its shores are covered with black forests, abounding with an infinite variety of animals and rare birds. All the rivers which rise on the southern declivity of the chain of Venezuela, and on the eastern declivity of the Andes, between the parallels of 2° 9′ north latitude, are tributaries to the Orinoco, which conveys to the ocean the waters of an immense basin extending from east to west about 1000 miles, and from north to south from 500 to 600. This river was discovered by Columbus in 1498; and Diego de Ordez was the first who entered it, he having sailed up it in 1531. The soundings between Fort San Francisco de la Guiana and the channel of Limon are sixty-five fathoms, measured in 1734 by the engineer Don Pablo Dias Laxardo, and at the narrowest part more than eighty fathoms deep. In the months of August and September the river is accustomed to rise twenty fathoms at the time of its swelling or overflow, which lasts for five months; and the natives have observed that it rises a yard higher every twenty-five years. The flux and reflux of the sea is clearly distinguishable in this river for 160 leagues. In the part where it is narrowest stands a formidable rock in the middle of the water of forty yards high, and upon its top is a great tree, the head of which alone is never covered by the waters, and is very useful to mariners as a mark to guard against the rock. Such is the rapidity and force with which the waters of this river rush into the sea, that they remain pure and unconnected with the waters of the ocean for more than twenty leagues' distance.

15. There is a peculiar phenomenon in this river, namely, that it rises and falls once a year only; for it gradually rises during the space of five months, and then remains one month stationary; after which it falls for five months, and in that state continues for one month also. These alternate changes are regular, and even invariable, and may depend on the rains which fall in the mountains of the Andes every year about the month of April.

16. The river La Plata ranks in size next to the Maragnon, and gives its name to some very extensive provinces to the south of Brazil. It was discovered by the pilot Juan Diaz de Solis in 1515, who navigated it as far as a small island in south latitude 34° 23′ 30″; and who, having seen on the shores some Indian cabins, had the boldness to disembark with ten men; when they were all put to death by the native inhabitants. Five years afterwards there arrived here Sebastian Gaboto, who passed from the service of the English to that of the Spaniards, by the former of whom he was sent to the discovery of the strait of Magellan; but, finding himself impeded in his views by an insurrection of his people, he was under the necessity of entering the river La Plata, and sailed as far as the island discovered by Solis, to which he gave the name of San Gabriel. Seven leagues above this island he discovered a river called San Salvador, and another at thirty leagues' distance, which the natives called Sarcana, where he built a fort, which he called the tower of Gaboto. He then pursued his voyage as far as the conflux of the rivers Paraná and Paraguay, and, leaving the former to the west, entered by the second, and had a battle with the Indians in which he lost twenty-five men; but succeeded in routing the infidels, taking from them many valuables of silver; and, supposing that there was an abundance of this metal in the territories washed by this river, he conferred upon it the name of Rio la Plata, (river of silver,) whereby it lost the original name of Solis, given it by the discoverer.

17. This river is accustomed to have such excessive high floods as to inundate the country for many leagues, fertilizing it as the Nile does Egypt. It abounds with an incredible multitude of fish, and on its shores are numerous most beautiful birds. The distance from the conflux of the Paraguay and Parana to its mouth, is about 200 leagues by the course of the river, the whole space being filled with the most delightful islands, and being navigable for the largest vessels. By some writers this broad river has been called an estuary formed by the Uruguay and the Parana, which unite near latitude 34° south, since it is nowhere less than thirty miles broad, and at its entrance into the ocean, between the parallels of 35° and 36°, expands to the

width of 150 miles. It contains numerous rocks and shoals, on which many valuable vessels have been wrecked. Impetuous winds prevail in this river, which the natives call pamperos; and which blow from west to south-west, acquiring from the shore so much the greater force in proportion to the smallness of the obstacles they find to impede their course, sweeping over llanuras of 200 leagues without being interrupted either by mountains or trees. On some occasions, though not very frequently, a regular hurricane takes place here; which, if it takes its course along the river, no vessel can resist, but its masts are immediately snapped in twain, as has happened to some ships, even when their top-masts and yard-arms were struck. In this river storms are more frequent than at sea. It laves the cities of Buenos Ayres, the colony of Sacramento, and Monte Video. It has some very good ports, and its mouth is in south latitude 35° 30′.

18. The Uruguay, the eastern branch of the Plata, rises on the western declivity of the Andes of Brazil; and pursues a south-westerly course of more than 1000 miles, for the last 200 of which it is navigable. The Paraná, or western branch of the Plata, is formed by an union of several small streams, rising also on the western declivity of the Andes in Brazil, between 18° and 21° degrees south latitude. After running about 1000 miles in a south-westerly direction, it receives the Paraguay from the north; and, after a further course of 500 miles, joins the Uruguay. The fine river Paraguay has its remote springs to the west of the heads of the Arinas, in latitude 13°; and, after pursuing a southerly course through nearly 14° of latitude, joins the Paraná in the parallel of 27° south latitude. The confluence of the Jauru with the Paraguay is a point of much importance: it guards and covers the great road between Villa Bella, Cuiaba, and their intermediate establishments, and in the same manner commands the navigation of both rivers, and defends the entrance into the interior of the latter captainship. The Paraguay from this place has a free navigation upward almost to its sources, which are about seventy leagues distant, with no other impediment than a large fall. These sources are said to contain diamonds.

19. Between the Paraguay and the Paraná there runs from north to south an extensive chain of mountains, which have the appellation of Amanbay; they terminate to the south of the river Iguatimy, forming a ridge running south and west, called Maracaver. From these mountains spring all the rivers which, from the Taquari south, enter the Paraguay; and from the same chain also proceed many other rivers, which, taking a contrary direction, flow into the Paraná; one of them, and the most southern, being the Iguatimy, which has its mouth in latitude 23° 47′ a little above the Seven Falls, or the wonderful cataract of the Paraná. This cataract is a most sublime spectacle, being distinguished to the eye of the spectator from below by the appearance of six rainbows, and emitting from its fall a constant cloud of vapours, which impregnates the air to a great distance.

20. From the river Xexuy downwards the Paraguay takes its general source south for 32 leagues to the city of Assuncion, the capital of Paraguay, and the residence of its governor. Eleven leagues to the south of Coimbra, on the west side of the Paraguay, is the mouth of Bahia Negra, a large sheet of water of six leagues in extent, being five leagues long from north to south; it receives the waters of the wide-flooded plains and lands to the south and west of the mountains of Albuquerque. At this bay the Portuguese possessions on both banks of the Paraguay terminate.

21. To the above rivers we may add the Janeiro, a river giving the name to that captainship in Brazil, being so called from its being discovered on the 1st of January, 1516, and which forms a large and convenient bay, much frequented by merchant vessels; the Apure, which, after running 300 leagues through the kingdom of Granada, enters by three mouths into the Orinoco with such force, that the latter resigns its current to the influence of the Apure for upwards of a league; the Negro, also tributary to the Orinoco, which it enters at a disembogue-ment a league and a half wide; the Valdivia, in the kingdom of Chili, which is so large, clear, and deep, that vessels of the greatest burden come close up to the city, three leagues from its mouth; the Biobio, and the Maule, both in the kingdom of Chili, whose shores abound no less in natural curiosities, and in gold and silver minerals, than they are noted for the famous battles fought between the Spaniards and the native Araucanians. In the Maule is found a clay as white as snow, smooth and greasy to the touch, extremely fine, and sprinkled with brilliant specks. It is found on the borders of several rivers and brooks in the province of Maule, in strata which run deep into the ground. Its surface, when seen at a distance, has the appearance of ground covered with snow; and is so unctuous and slippery, that it is almost impossible to walk upon it without falling. It does not effervesce with acids; and, instead of losing in the fire any portion of its shining whiteness, it acquires a slight degree of transparency. It is believed to be very analagous to the kaolin of the Chinese; and that, combined with fusible spar, of which there are great quantities in the province, it would furnish an excellent porcelain.

22. The deserts of South America are vast and numerous, and are commonly known under the titles of paramos, llanos, and savannas. The former consist of table-lands resting upon mountains, several of them of greater altitude than the highest mountains of the Old World; the llanos are plains of the level country, of many leagues in extent; and, with the savannas, are sometimes entirely barren and sandy, and sometimes covered in part, particularly on the verge of the valleys or ravines, with rank vegetation. These deserts are common to every part of South America; but those in the neighbourhood of Caracas and La Plata are the most extensive. In the latter the traveller will sometimes see large flocks of cattle, of all descriptions, hurrying to some distant lake, to which they are

led by instinct, to quench their parching thirst; and with such force do they plunge into the water, that those who arrive first are sure to be drowned by the motion of those that are behind preventing them from recovering the shore.

23. The lakes of this country are rather large than numerous; many of them being nothing but the overflowings of immense rivers, and accordingly appearing in the winter, and being perfectly dried in the summer, when they form many of the savannas of which we have just spoken. Amongst the regular and more important lakes we shall particularize the following:—the lake of Maracaibo took its title from a cacique of this name, who was living at the time of the entrance of the Spaniards. It is about 132 miles long from north to south, and, at the broadest part, 90 wide (though Coleti reduces it to 33), and is formed by many rivers. In it are two small islands, the one called De las Palomas, the other De la Vigia. In the high sea-tides, the waters of the gulf of Venezuela enter this lake, and then they are somewhat brackish. Its first discoverer was Bartholomew Sailler, a German lieutenant of the General Ambrosio de Alfinger, who entered it in 1529; and, from having found a number of houses built in the same manner as they are at Venice, gave it the name of Venezuela. There are not more than four very small settlements; and the beams of timber on which the houses are built are converted into stone as far as they are immersed in the water. The extraordinary lake of Valencia is of an oblong form, and, although it receives the waters of twenty rivers, has no visible outlet. It has been diminishing for twenty years, and its waters, as they recede, leave behind them a rich productive soil, but an unhealthy air. The cultivators are, in some parts, from the want of water, under the necessity of draining the neighbouring streams to irrigate their plantations. The eastern side is laid out in tobacco-grounds. The lake of Parima, in Guiana, is an oblong sheet of water, 100 miles long, and 50 broad, in an island of which is a rock of glittering mica, celebrated as having been the seat of El Dorado, a supposititious city, the streets of which were paved with gold, alluded to by Milton in his Paradise Lost.

24. No country in the world is more famous for its enormous gulfs than South America. The Gulf of Mexico of itself is an extensive sea, which almost intersects the two continents. Mr. Thompson has published a tract, wherein he attempts to explain how this gulf has been formed by the natural ablution of ages. He shows that there is a constant stream running from the bottom of New Holland, round the Cape of Good Hope, and across the Atlantic, into this gulf, whence it runs up the side of North America, forming the gulf-stream, and so onwards to the north beyond Newfoundland, &c. He also points out the peculiar circumstance of this stream's following the exact course of the sun's ecliptic, and ending, with respect to the gulf, exactly in that point where the continent is narrowest, namely, at the isthmus of Darien or Panama. The cutting across this isthmus has long been a subject of interest with politicians, and nature will probably effect what human skill and labour could never hope to accomplish. It is a fact but little known, yet decidedly true, that the sea on the side of the gulf is about twenty-five feet higher than the waters in the South Sea on the opposite side. When Buonaparte had thoughts of going through Egypt to India, he sent some cognoscenti to survey the passage of the Red Sea, who pronounced the waters of this arm of the ocean to be about twenty-seven feet higher than the waters of the Mediterranean. The coincidence is strong and striking; and argues amongst other speculations the great probability that the waters of this gulf will, in the course of time, work their own way into the Southern or Pacific ocean. In long. 79° 19′ W. lat. 9° 30′ N. of this sea is the fine bay of Panama. The port is formed by some islands two leagues and a half distant from the town, where vessels may lie sheltered from the winds. The tides are regular; high-water is every three hours, when it runs to a great height, and falls with such rapidity as to leave three quarters of a league dry when down.

25. The harbour of Valdivia is the safest, and, from its natural position, the strongest and most capacious of any of the ports in the South Sea. The island of Manzera, situate in the mouth of the river, forms two passages strongly fortified, and bordered by steep mountains. San Miguel, a gulf in the province of Terra Firma, is beautiful and capacious, having its mouth, or entrance, closed in by a shoal called El Buey, there being only a narrow channel left for the course of vessels. Within it are many small rocks or reefs, and into it runs a large river, which flows down from the mountains of the same province. The port of Buena Ventura, in the district of the province of Choco, is also on the South Sea, where there is a small settlement, subsisting only by means of the vessels which arrive at it. It is of a very bad temperature, and difficult to be entered; and the road to the city of Cali is so rough as to be passed only upon men's shoulders—a circumstance which arises from the inaccessible mountains which lie in the route. It is thirty-six leagues from Cali, and is the staple port of this place, Popayan, Santa Fé, &c. Long. 76° 48′ W. lat. 3° 51′ N. In Chiloe, an island dependent upon the government of Chili, there are two excellent ports, of which Chacas, in lat. 41° 50′ south, is the best. Castro, the capital city, is also a good port, and lies between two small rivers. It is inhabited by some good and opulent families, and enjoys a pleasant and healthy temperature. It is of a regular and beautiful form, and is also called Chiloe, and has, besides the parish church, a convent of monks of St. Francis, and a bishop auxiliary to that of Santiago. It was sacked by the Dutch in 1643; is 42 leagues south of the city of Osorno, in lat. 42° 40′ S. But no bay on the western side of this continent deserves more to be noticed than that of Conception; it is large, noble, and convenient. Its only defence is a battery, on a level with the water, which defends its anchoring-ground.

26. On the coast of Terra Firma is the gulf of Cumana, so called from the capital on its shores. This bay runs ten or twelve leagues from west to

east, and is one league broad at its widest part. It is from 80 to 100 fathoms deep, and the waters are so quiet as to resemble rather the waters of a lake than those of the ocean. It is surrounded by lofty chains of mountains, which shelter it from all winds, excepting that of the north-east, which, blowing on it through a straitened and narrow passage, is accustomed to cause a heavy swell, especially from ten in the morning until five in the evening, after which all becomes calm. In the above case the larger vessels ply to windward; and if the wind be very strong they come to an anchor on the one or other coast, and wait till the evening, when the land breezes spring up from the south-east. In this gulf there are some good ports and bays, as the lake of Obispo, of Juanantar, of Gurintar, and others. The gulf of Guayaquil, in north lat. 2° 27′, so called from the river of its name, is famous for its shifting sand-banks, on which, as the river recedes, alligators are left in great numbers. Vessels, after leaving their guns in the island of La Puna, require to be steered by an experienced pilot. Gulf Triste, in the Atlantic, and in the province of Caracas, is sixteen leagues wide from the point of Carvalleda to the S.S.E. as far as cape Muerto to N.N.E., and about nine leagues in depth. It was so named on its first discovery by Columbus in his fourth voyage, 1498, to commemorate the misfortunes he suffered here.

27. In the gulf of Cumana, in the province of that name, are several convenient ports and bays; indeed the whole coast is beautifully indented with them: the sea is here remarkably calm, and peculiarly so in the celebrated gulf of Cariaco, the gulfs of the lake of Obispo, Guanantar, Gurintar, &c. Within cannon-shot of the shore of the gulf lies the city of Cumana, in a semicircular form, where all kinds of vessels may be built: a saline ground on its beach supplies salt for the use of the city and the neighbouring settlements. It lies in the middle of the plain of its name. At the back begins the serrania, which, for more than eight leagues, is impassable on account of brambles and thorns. The soil towards the front of the city is composed of pebble, gypsum, and sand, which, during the prevalence of the wind briza, occasions an excessive heat, and is very offensive to the eyes; bad sight here being a very common malady. Nearly in the centre of the town, upon an elevated ground, stands the castle of Santa Maria de la Cabeza, which is of a square figure, and commands the city. In the lofty part of the sierra are seen three round hills; upon the highest of which stands a castle called San Antonio, and upon the lowest a fort called La Candelaria. There is upon the beach another castle, called the fort of Santa Catalina, at the mouth of the river, just where a sand-bank has of late been formed so as to block up the entrance of the river, and to render it dangerous for large vessels. The fort is at some distance from the gulf. Todos Santos is one of the best of the numerous bays on the coast of Brazil. It is three leagues from the entrance from the bar of San Antonio to the strait of Tapagipe, twelve leagues in diameter, and thirty-six in circumference. It is convenient, secure, and full of islands; and its vicinities are covered with sugar-engines and estates. Porto Seguro, on the same coast, takes its name from the security it afforded to Pedro Alvarez Cabral, who, when he discovered it, found it a shelter from tempests. The capital is situate on an eminence, and defended with good fortifications and a castle. The town is small, handsome, rich, commercial, and well peopled. Its climate is hot, but healthy. It is 92 miles south of San Jorge, and 286 N.N.E. of EspiriterSanto. Long. 39° 37′ W. lat. 16° 7′ S.

28. The harbour of Rio de Janeiro is one of the finest known, having at its entrance a bar, at the extremes of which rise two rocks. This bay is twenty-four leagues in length, and eight in width; in which are many islands, the most celebrated of them being that called De Cobras, off which the ships cast anchor. On the opposite side of the city a natural wall of rocks, called Los Organos, extends itself as far as the sea; forming, independently of the neighbouring fortresses, a perfect line of defence. The bay of Maranham, 492 miles north-west of cape St. Roque, affords a convenient harbour at the mouth of the river St. Mary. The straits of Magellan, at the southern extremity of this continent, are amongst the most celebrated in the world, both for their length and the difficulty of their navigation. From cape Virgin Mary, in the Atlantic, west long. 68° 22′, south lat. 52° 24′, to cape Pillar, in the Pacific Ocean, west long. 75° 10′, south lat. 52° 45′, they have been estimated at 342 miles in length, and are of varying breadth, bounded northward by Patagonia, and on the south by Terra del Fuego. They derive their name from Hernando de Magallanes, who discovered them in 1520, and have been subsequently passed by Drake, Byron, Wallis, Carteret, and Bougainville. The straits of Le Maire form a safer passage from the Atlantic to the Pacific Ocean, westward of Terra del Fuego, and bounded on the east by Staten-Land. Le Maire, who was the first that doubled Cape Horn, and after whom they are called, first passed them in June 1615.

29. Some geographers have called the passage formed by the eastern mouth of the Maragnon, and the island of Morajo, by the name of the straits of Maguari; and various minor passages, formed by the numerous islands round the shores of this continent, have been dignified with this appellation.

30. Capes and promontories have generally the same names as the chief rivers or gulfs which surround them. Amongst the few that are worth enumerating is point Nata, or Chama, on the west point of the celebrated isthmus of Panama, from whence the coast tends west to Haguera Point seven leagues. All ships bound to the north-west, and to Acapulco, make this point. The promontory of Balleno, on the coast of Peru, to the south-south-east of the cape Borrachos, and north-north-east of Palmar, is surrounded by a sandy and level soil, and the water is very shallow. In Chili the point Cabero extends itself with a gradual slope into the sea; here the prevalence of the east winds [illegible] navigation. Pallena, lying between

the river and ravine of Cheoapa, in the province of Quillota, is well marked by navigators. Villiva, or Quedal, in the province of Valdivia, south lat. 41° 6′, is eighty miles south of that place, and is a noted land-mark. Cape Guia, between the point Aguja and the river Del Hacha, in the province of New Granada, is seen an immense distance from land.

31. The diversity of surface observed on this continent gives rise to a corresponding diversity in the climate. It is however, except in the mountainous regions, of a benign temperature, though the mighty influence of the Andes and their branches contributes to render it colder than parallel latitudes in the west. In Peru, the Andes mountains being on one side, and the South Sea on the other, it is not so hot as tropical countries in general; and in some parts it is disagreeably cold. In one part are mountains of a stupendous height and magnitude, having their summits covered with snow; on the other volcanoes flaming within, while their summits, chasms, and apertures, are involved in ice. The plains are temperate, the beaches and valleys hot; and lastly, according to the disposition of the country, its high or low situation, we find all the variety of gradations of temperature between the two extremes of heat and cold. It is remarkable that in some places it never rains, which defect is supplied by a dew that falls every night, and sufficiently refreshes the vegetable creation. In Quito they have prodigious rains, attended by tremendous storms of thunder and lightning. The city of Lima, though very healthy and pleasant, is infested by swarms of flies and musquitoes all the year round. Putrid fevers and convulsions are common. It is subject to terrible earthquakes, by which it has been frequently destroyed; the strongest of these occurred in the following years: viz. in 1582, 1586, 1609, 1630, 1655, 1678, 1687, 1690, 1697, 1699, 1716, 1725, 1734, 1743, 1746. In this last it was completely demolished.—The city of Callao, the port of Lima, was also by this earthquake totally destroyed, and swallowed up by the sea. By this terrible convulsion of nature upwards of 3000 people perished in Callao alone; and the ruins of the former town are yet to be seen under water, in a calm day, at that part of the bay called mar braba (rough sea). 'I became acquainted (says a modern traveller) with an old mulatto, called Eugenio, who was one of the three or four who were saved; he told me he was sitting on some timber which had been landed from a ship in the bay, at the time that the great wave of the sea rolled in and buried the city, and that he was carried, clinging to the log, near to the chapel, a distance of three miles.' *Stevenson's Twenty Years' Residence in South America*, vol. i. p. 138-9.

32. The maximum height of Reaumur's thermometer, in the province of Cumana, is twenty-seven degrees, the minimum seventeen degrees, in the month of July. In the paramos alone some change is to be perceived; although the manner in which these paramos are affected, and what may be considered the peculiar characteristic of their climate, is a dense cloud, which almost constantly envelopes them, and which, when it happens to fall in the shape of small hail, snow, or mist, makes them so insufferably cold as to render life precarious. With all this however, in the parts in which there are no paramos, and where the wind is moderate, and the rays of the sun can penetrate the earth, the climate is very salubrious.

33. The temperature of Caracas does not correspond with its latitude; for instead of insupportable heat, as might be expected so near the equator, it enjoys an almost perpetual spring, owing to its elevated situation. The transitions from heat to cold are great and sudden, and from these numerous diseases arise, the most common of which are colds, called by the Spaniards catarros. The height of Fahrenheit's thermometer at Caracas in the winter is:—

Generally at 6 A. M.	58°
2 P. M.	73
10 P. M.	68
Maximum	76
Minimum	52
In the summer:—	
Generally at 6 A. M.	72
2 P. M.	79
10 P. M.	75
Maximum	85
Minimum	69

Humidity according to the hydrometer of Du Luc:—

Generally	47
Maximum	58
Minimum	37

The mercury which rises in the most southern parts of Europe, and in the variations of the atmosphere to $\frac{1}{12}$ths of the Paris inch, ascends only $\frac{7}{12}$ths in the eastern parts of Terra Firma. They observe at Caracas, in all seasons, four small atmospherical variations every twenty-four hours; two in the day, and two in the night. Blue of the skies by the cyanometer of Saussure:

Generally	18°

Oxygen and nitrogen gas; of one hundred parts, twenty-eight of oxygen, and seventy-two of nitrogen:—

The maximum of the first is	29°
The minimum	27½

Variation of the needle September 17th. 1799, 4° 38′ 45″. Inclination of the dipping needle: generally $43\frac{53}{100}$. Oscillation of the pendulum: in fifteen minutes, 1270 oscillations.

34. For climate Chili is one of the finest countries in the world. Though bordering on the torrid zone it never feels the extremes of heat, being secured on the east by the Andes, and refreshed from the west by cooling sea-breezes. The seasons revolve in regular succession, as in all the countries of the southern hemisphere: the spring commences on the 22nd September, the summer in December, the autumn in March, and the winter in June. From the opening of spring until the autumn, there is a constant succession of fine weather, particularly between the 24° and 36° of latitude; but in the woody islands the rains are frequent even in summer. The rainy season on the continent usually commences in April, and continues until the end of August, but is seldom accompanied

with hail storms, and thunder is scarcely known in the country. Lightning is wholly unknown; and although in the Andes mountains, and near the sea, storms occasionally arise, yet, according to the direction of the wind, they pass over, and take their course to the north or south. Snow in the maritime provinces is never seen. In those nearer the Andes it falls about once in five years, and sometimes still more distant, and then but in small quantities. The north and northerly winds, before they arrive at Chili, cross the torrid zone, and there becoming loaded with vapours, bring with them heat and rain. This heat, however, is very moderate; and it would seem that these winds in crossing the cold summits of the Andes become qualified, and lose much of their heat. In Tucuman and Cujo, however, where they are known by the name of sonda, they are much more incommodious and suffocating than even the siroc in Italy. The south winds are usually from the south-west, and, coming immediately from the antarctic pole, are cold and dry; these prevail in Chili during the time that the sun is in the southern hemisphere; and blow constantly towards the equator, the atmosphere being at that period highly rarefied, and no adverse current of air opposing itself to their course. As they disperse the vapours, and drive them towards the Andes, it rains but seldom during their continuance. But clouds collected upon these mountains, uniting with those which come from the north, occasion very heavy rains, accompanied with thunder, in all the provinces beyond the Andes, particularly in those of Tucuman and Cujo, while, at the same time, the atmosphere of Chili is constantly clear, and its inhabitants enjoy their finest weather. The contrary, however, takes place in winter, which is the fine season in these provinces, and the rainy one in Chili.

35. The south wind never continues blowing during the whole day with the same force; as the sun approaches the meridian it falls very considerably, and rises again in the afternoon. At noon, when this wind is scarcely perceptible, a fresh breeze is felt from the sea, which continues about two or three hours; the husbandmen give it the name of the twelve o'clock breeze, or the countryman's watch, as it serves to regulate them in determining that hour, This sea-breeze returns regularly at midnight, and is supposed to be produced by the tide; it is stronger in autumn, and sometimes accompanied with hail. The east winds rarely prevail in Chili, their course being obstructed by the Andes. Hurricanes, so common in the Antilles, are unknown here. One solitary example, indeed, exists of a hurricane, which in 1633 did much injury to the fortress of Caremalpo, in the south part of the kingdom. The mild temperature of Chili depends upon the succession of these winds, as a situation so near the tropic would naturally expose it to a more violent degree of heat. In addition to which, the tide, the abundant dews, and certain winds from the Andes, which are distinct from the east winds, cool the air in summer, and render the country agreeable in the extreme. The inhabitants of the sea-coast dress the same in the winter as in the summer; and, in the interior, where the heat is most perceptible, Reaumur's thermometer scarcely ever exceeds 25°. The nights throughout the country are generally of a mild temperature. The warmth of the soil far exceeds that of the atmosphere; and hence, notwithstanding the moderate heat of Chili, all the fruits of warm countries, and even those of the tropics, arrive to great perfection. The countries bordering on the east of Chili do not enjoy these refreshing winds, but, on the other hand, experience the air as suffocating and oppressive as under the same latitude in Africa.

36. Meteors, especially those called shooting stars, are frequent in Chili, and are to be seen there almost the whole year; also balls of fire, that usually rise from the Andes, and fall into the sea. The aurora australis, on the contrary, is very uncommon; that which was observed in 1640 was most remarkable, and was visible, from the accounts that have been left us, from February until April. During the last century they have appeared at four different times. In the Archipelago of Chiloe this phenomenon is more frequently visible, from the greater elevation of the pole in that part of the country.

37. In ascending the Andes the climate varies exceedingly, and illustrates, in proportion to its elevation, the general temperature which prevails upon different parts of the continent, calling forth the various vegetable productions indigenous to every portion of the globe. At the elevation of from 3000 to 5000 feet, maize, plantains, indigo, sugar, cotton, coffee, cassava, and cacao, are produced. Cotton, coffee, and sugar, grow at a much greater elevation; and the last is successfully cultivated even in the valley of Quito. From 6000 to 9000 feet in elevation the climate is suited to the growth of the various kinds of European grain, the oak, and various other species of forest trees. Above that altitude large trees of all kinds begin to disappear except dwarf pines, which are found at nearly 13,000 feet elevation above the level of the sea, and about 2000 feet below the line of perpetual snow. From 13,000 to 15,000 the ground is clothed with grasses; and from the latter extreme the lichen is the only plant, which creeps on the rocks and seems to penetrate under the snow. The following table will afford the reader a more perfect view of the important data connected with this interesting subject:

Under the Equator.	ft. above the sea.
The highest flight of the condor . .	21,900
——— limit of the lichen . . .	18,225
Lower limit of perpetual snow . . .	15,730
The highest limit of pines	12,800
——— of other trees . . .	11,125
——— of oaks	10,500
———of the Peruvian bark tree	9,500
——— of palms and bananas	3,280
The lowest limit of pines	5,685
The distance between corn and snow, according to Humboldt . . .	5,000

38. The greatest volcanic eruption ever known in Chili, was that of Peteroa on the 3rd of December, 1760, when a new crater was formed, and a neighbouring mountain rent asunder for many miles in extent; the eruption was accompanied by a dreadful explosion, which was heard throughout the whole country. It was not, however, succeeded by any very violent shocks of an earthquake. The quantity of lava and ashes filled the neighbouring valleys, and occasioned a rise of the waters of the Tingeraca, which continued for many days. The course of the Lontue, a very considerable river, was impeded for ten days by a part of the mountain which fell and filled its bed; till at length the water forced itself a passage, overflowed the neighbouring plains, and formed a lake, which still remains. Besides those of the Andes, there are but two volcanoes; the first, at the mouth of the river Rapel, is small, and discharges only a little smoke from time to time; the second is the great volcano of Villarica, in the county of Arauco. This volcano may be seen at the distance of 150 miles; and, although it appears to be insulated, is said to be connected by its base with the Andes. The summit of the mountain is covered with snow, and is in a constant state of eruption. Its base is fourteen miles in circumference, and is principally covered with pleasant forests; from its sides a great number of rivers emerge; and its perpetual verdure furnishes the best criterion of the comparatively trifling violence of its eruptions.

39. The inhabitants of Chili usually calculate three or four earthquakes annually, but they are very slight, and little attention is paid to them. Of the great earthquakes, not more than five occurred from the arrival of the Spaniards to the year 1818, a period of 244 years. It has been ascertained that earthquakes in this country never occur unexpectedly; but are announced by a hollow sound proceeding from a vibration of the air; and, as the shocks do not succeed each other rapidly, the inhabitants have sufficient time to provide for their safety. However, in order to secure themselves from the effects of these catastrophes, they have built their cities in a judicious manner; the streets are so broad, that the inhabitants would be safe in the middle of them, even should the houses on both sides fall to the ground. The houses have also spacious courts and gardens, which would serve as places of refuge; and those who are wealthy have usually in their gardens several neat wooden barracks where they pass the night whenever they apprehend an earthquake. The earthquakes in Chili, owing probably to subterraneous passages communicating with the volcanoes of the Andes, which are so many vent-holes for the inflamed substances, are much more moderate than those of many other parts of the continent, and have never hitherto been attended with any considerable sinking of the earth, or falling of buildings. Were it not for the number of these volcanoes, Chili would in all probability be rendered uninhabitable.

40. In the eastern part of the continent the weather is generally humid; and, in the winter months (June, July, and August), at times boisterous, and the air keen and piercing. In summer, also, the serenity of the atmosphere is frequently interrupted by tremendous thunderstorms, preceded by dreadful lightning, which frequently damages the shipping, and followed by heavy rain, which sometimes destroys the harvest. The heat is troublesome, and engenders swarms of musquitoes in such numbers that they infest every apartment.

41. By far the greater part of the precious metals used in the world are brought from America, and, with the exception of those from the mines of Mexico, almost all from the southern continent. It is impossible to give any adequate description of the treasure of these mines: many of them are inexhaustible, and many hundreds have ceased to be worked on account of the want of quicksilver, and from their being filled with water. The former objection is owing, in a great measure, to the government monopolies, and the latter to the want of steam-engines. Some of those recently sent have effectually drained the pits; and afforded a lucrative return to the projectors. The Spanish government, since the discovery of this country, has derived its principal resources from these metals; and to secure to itself the undivided enjoyment of them has passed the most rigid laws, to prevent as far as possible all intercourse of the nations with foreign powers. The annual produce of the mines of New Granada, as calculated from the amount of the royal duties, and therefore considerably under the truth, amounts to 18,000 Spanish marks of pure gold, and very few of silver; the value in dollars is 2,624,760, the gold being estimated at $145\frac{3}{10}$ dollars, and the silver at $9\frac{4}{10}$ dollars the Spanish mark. Besides this we must add for contraband 1,735,240 dollars, and the total produce will then be 4,360,000 dollars.

42. In the northern parts of Peru are the famous mines of Potosi, several of them gold, but those of silver are found all over the country; and never in any country did nature afford to the avidity of man such endless sources of wealth. These mines were discovered in the year 1545 in the following manner, which we give in the terms of a late popular publication: 'An Indian named Hualpa, one day following some deer, which made directly up the hill of Potosi, came to a steep craggy part of the hill; and, the better to enable him to climb up, laid hold of a shrub, which came up by the roots, and laid open a mass of silver ore. He for some time kept it a secret, but afterwards revealed it to his friend Guanca, who, because he would not discover to him the method of refining it, acquainted the Spaniard his master, named Valaroel, with the discovery.' Valaroel in 1545 registered the mine; and, from that time till the year 1638, the mines of Potosi had yielded 95,619,000 pieces of eight, or about 4,255,000 pieces a year. But the annual sum derived from these mines, according to the latest accounts, and as calculated from the produce of the royal duties, and therefore considerably under the truth, amounts to 3,400 Spanish marks of pure gold, and 513,000 of pure silver. The value in dollars of both is 5,317,988; the gold being estimated at $145\frac{3}{10}$

dollars, and the silver at $9\frac{4}{10}$ dollars the Spanish mark; to which if we add for contraband 922,012 dollars, the total produce will be 6,240,000.

43. The following table will exhibit the increasing amount of the produce of these mines of late years.

Produce of Potosi in Gold and Silver.

	GOLD. Value in Dol.	Rls.	SILVER. Dol.	Rls.
Annual average from 1780 to 1790	257,247	1	3,960,010	7
Coinage of 1791	257,526	0	4,365,175	0
Coinage of 1801	481,278	0	7,700,448	0

Thomas Valaroel was the first person who examined this mine. The mountain is three miles in circumference, and 6000 Castillian yards high above the level of the sea, as it was measured by Don Louis Godin, of the academy of the sciences of Paris. It is of a sharp conical figure, and resembles a great pavilion, but is nearly hollow in the interior from the excavations which have been made for so many years. In appearance it resembles an ant-hill, from the multitude of mouths by which it is entered.

44. The silver mines of Esquilache, in Peru, are so rich that the bishop's yearly dues from the labourers amounted to 14,000 dollars; and one of the thirty-six which lay close together in that neighbourhood, was not long since sold for no less than a daily rent of 1,040 dollars. The mines are however but half worked for want of mechanical power, though great quantities of silver are excavated. Alcedo observes, that if these mines were emptied of their water, they would yield twenty times as much ore as at present. In Chili are mines of silver, copper, lead, sulphur, white lime and salt, but the most abundant are of copper; large quantities of this metal have been sent to Spain for founding artillery, and from the same source has been made all the artillery in this kingdom. Of this metal are found two sorts: campanel, which is only fit for founding, and de labrar, which has a mixture of gold, and is an excellent working metal.

45. In the province of Santiago are mines that can be worked only in the summer months, namely, December, January, February, and March, owing to the rains, snow, and severity of the winters. Twenty leagues from the capital is the great mine of Kempú, which has no fewer than sixteen veins. Further south is a mine, named Maipo, discovered more than 100 years ago, and called San Simon, the metals of which are lowered down by engines from a very lofty mountain. Here also are the mines of De San Pedro Nolasco, which render a considerable portion of massy silver. On the north part, by the mountains of the curacy of Colina, are found thirty-four gold mines, independently of 200 others, all of which are worked. Besides these mines there are five lavaderos, or washing-places, in the mountain of Guindo; and some other veins in the old asiento of Tiltil. The top of Calen is covered with lavaderos of the richest gold. The total amount furnished annually in gold and silver, by the mines of what is commonly called Spanish America, is exhibited in the following table:

	£ sterling.
New Spain	5,030,800
New Granada	507,000
Peru and Chili	1,730,000
Buenos Ayres, or La Plata	882,000
Making a total of	£8,149,800

to which may be added more than another million for the contraband trade.

46. It was not till after the expulsion of the Dutch, that the Portuguese began to be aware of the riches they possessed in their mines. The government being under the Portuguese minister, was then vested in some priests of acknowledged virtue: these scattered themselves over the whole coast, founding settlements, and penetrating into the interior; and first discovered the different gold mines which have been since worked to such prodigious emolument; as also the mines of diamonds, topazes, and other precious stones.—Those of Cuiaba have been worked since the year 1740, and yielded great quantities of gold.

47. Formerly Bahia de Todos Santos, or the bay of All Saints, was the principal seat of the government, and chief mart of the commerce of Brazil; but the discovery of the gold and diamond mines near Rio de Janeiro, has given a decided superiority to the latter. The manner in which the former of these minerals was discovered is differently related: we quote the most common account from a late publication: 'The Indians on the back of the Portuguese settlements were observed to make use of gold for their fish-hooks; and enquiry being made as to their manner of procuring this metal, it appeared that considerable quantities of it were annually washed from the mountains, and left among the gravel and sand that remained in the valleys after the running off or evaporation of the water. From the time of this discovery considerable quantities of gold were imported into Europe from Brazil; and these imports have gradually augmented since new mines have been wrought in many other provinces. The extraction of this precious metal is neither very laborious nor attended with the smallest danger in this part of the new world. The purest sort is generally found near the surface of the soil, though it is sometimes necessary to dig for it to the depth of three or four fathoms. It is usually incumbent on a bed of sandy earth, termed by the natives saibro. Though, for the most part, the veins that are regular and run in the same direction, are the richest, it has been observed that those spaces, the surface of which was most spangled with crystals, were those which furnished the greatest plenty of gold. It is found in larger pieces on the mountains and barren or stony rocks than in the valleys, or on the banks of rivers. But in whatever place it may have been gathered, it is of $23\frac{1}{2}$ carats on coming out of the mine, unless it be mixed with sulphur, silver, iron, or mercury; a circumstance that rarely occurs, except at Goyas and Araès.'

48. 'Every man who discovered a mine was obliged to give notice of it to the government. If it was conceived to be of little consequence by those persons appointed to examine its value, it was always given up to the public; but if, on

the contrary, it was found to be a rich vein, the government never failed to reserve a portion of it for themselves: another share was given to the commandant; a third to the intendant; and two shares were awarded to the discoverers: the remainder was divided among the miners of the district, in proportion to their circumstances, which were determined by the number of their slaves. The disputes to which this species of property gave rise, fell under the cognizance of the intendant, with the right of appeal from his decrees to the supreme court established at Lisbon, under the title of council d'outremer. It is said that a slender vein of this metal runs through the whole country, at about twenty-four feet from the surface; but is too thin and poor to answer the expense of digging. Gold is always, however, to be collected in the beds of rivers which have pursued the same course for a considerable time; and, therefore, to be able to divert a stream from its usual channel is esteemed an infallible source of gain.'

49. The employment of searching the bottoms of rivers and torrents, and washing the gold from the mud and sand, is principally performed by slaves (chiefly negroes), of whom the Portuguese keep great numbers for that purpose. By a particular regulation these slaves are obliged to furnish their master every day with the eighth part of an ounce of gold; and if, by their industry or good fortune, they collect a larger quantity, the surplus is considered as their own property, and they are allowed to dispose of it as they think fit; by which means, some negroes have lived in great splendour, and purchased slaves of their own; the Portuguese ounce is somewhat lighter than our troy ounce. The proprietors of the mines paid to the king of Portugal, as abovementioned, a fifth part of the gold which they extracted by operations more or less successful; and this fifth of the gold obtained from all the mines in Brazil was estimated, at an average, to amount annually to about £300,000 sterling; consequently the whole capital must be nearly £1,500,000 sterling. If we add to this the gold exchanged with the Spaniards for silver, and what was privately brought to Europe without paying the duty, which amounted to £500,000 more, the annual produce of the Brazilian mines was about £2,000,000 sterling.

50. Among the many impediments thrown in the way of trade, may be ranked the prohibition which prevented the people of Brazil from working up the gold of their own mines. Even the tools and instruments used by the artificers for such purposes, were seized and confiscated. It was only about the beginning of the last century that diamonds made a part of the exports from Brazil to Europe. These valuable stones are, like the gold, found frequently in the beds of rivers and torrents. Before they were supposed to be of any value they were often perceived in washing the gold, and were consequently thrown away with the sand and gravel; and numbers of large stones, that would have enriched the possessors, passed unregarded through the hands of several persons wholly ignorant of their nature. The diamonds sent from the new to the old world were enclosed in a casket with three locks, the keys of which were separately put into the hands of the chief members of administration; and those keys were deposited in another casket, to which was affixed the viceroy's seal. While the exclusive privilege subsisted, this precious deposit, on its arrival in Europe, was remitted to government, which, according to a settled regulation, retained the very scarce diamonds, which exceeded twenty carats, and delivered every year, for the profit of the company, to one, or to several contractors united, 40,000 carats, at prices which have successively varied. An engagement was made on one hand to receive that quantity; and on the other not to distribute any more; and whatever might be the produce of the mines, which necessarily varied, the contract was invariably fulfilled.

51. Before the recent changes in the Portuguese government, that court threw 60,000 carats of diamonds into trade, which was monopolized by a single merchant, who paid for them at the rate of about £1. 11*s*. 6*d*. per carat, amounting in the whole to £130,000 sterling. The contraband trade in this article is said, by persons competent to form a just estimate on the subject, to have amounted to a tenth more; so that the produce of these mines, the riches of which have been so much boasted of, did not exceed annually £140,000. The rough diamonds used to be purchased from the Portuguese merchants by the English and the Dutch, who, after cutting and polishing them, and supplying the demand of their own countries, disposed of what remained to other nations of Europe. In the diamond and mine districts are found, between the parasitic stones, amethysts, topazes, sapphires, emeralds, and fine chrysolites. Jacinths or granites are sometimes discovered in the interstices of talc, or micaceous stones; but these, as well as some other precious stones, have never been subjected to a monopoly like diamonds. The annual exportation of these stones from Janeiro, and some of the other ports, seldom exceeded £6,250, for which the government received a duty of one per cent. amounting to the sum of £62. 10*s*. sterling.

52. Mines of iron, sulphur, antimony, tin, lead, and quick-silver, are found in this and other provinces of Brazil; but the pursuit of gold has diverted the attention of the colonists from more useful speculations. It was long supposed that copper had been withheld by nature from this vast and fruitful region of the new hemisphere; but later researches have shown this to be an unfounded suspicion. In Rio de Janeiro there exists a rich and copious mine of cupreous pyrites (pyrites cupri); one cwt. of this mineral yields 25lbs. of pure copper. Similar mines of this metal have also been discovered in Minas Geraes, and other districts.

53. In fruit-trees, vegetables, and nutritive roots, South America is extremely rich, and in different kinds of wood for building, dyeing, &c. Independently of many kinds peculiar to this country, vast numbers have been introduced since the sixteenth century. The inhabitants of western Europe have deposited in America what they have been receiving for 2,000 years, by their communications with the Greeks and Romans.

by the irruption of the hordes of central Asia, by the conquests of the Arabs, by the crusades, and by the navigations of the Portuguese. All these vegetable treasures, accumulated in an extremity of the Old Continent by the continual flux of nations towards the west, and preserved under the happy influence of an increasing civilization, have become almost at once the inheritance of Mexico and Peru. In Peru, as well as in other parts, the culture of maize, pimento, and cotton, which was found established there, has not been neglected; and that of wheat, barley, cassava, potatoes, sugar, and the olive and vine, is attended to. Humboldt classes the Mexican wheat amongst that of the first quality, and as superior to that of Monte Video, which, according to Azara, has the grain smaller by one half than the Spanish. Maize, or Indian wheat, is used much by the natives; it is a genus of the monœcia triandria. The plant is one single stalk, which shoots out leaves more than a yard in length and three inches in breadth, and the fruit is a sort of cone, about a span in length, very closely set with grains of different colours; but generally white and yellow. They reckon five species, or rather varieties, of maize, which differ very little from each other. The method of sowing it is to make a hole, throw in a few seeds, and cover them, and without any further trouble it soon appears above ground, and is fit for reaping at the end of five months at latest: hence they easily obtain two crops in one year. The wheat, made into flour, serves for bread for all the Indians and common people; and is used in the composition of several dishes, as also to feed cattle, pigs, domestic animals, and poultry. The maize is evidently a native of the New World.

54. The plantain, next in importance to maize, is another principal food of the natives, and more particularly of the negroes. The fruit generally is about an inch and a half in diameter, and ten or twelve in length, something curved. It has the appearance of an hexagon, with the angles made round and terminating in hexagonal points. The skin, which is smooth, and of a green colour before it is ripe, afterwards becomes yellow, and contains a substance resembling cheese, without seeds, and only a few large fibres. After the plantain is past maturity the rind turns black, and the pulp becomes sour; but in taste is very similar to the pear. All classes of animals are very fond of it. The tree which bears the plantain gives fruit only once, in large bunches, and is immediately cut, or, if left, withers and falls; but the root, which is large, round, and solid, produces fresh supplies, which, in twelve or fourteen months, yield fruit and decay, and the roots shoot forth again with renewed vigour. The plant is not woody, nor has it any bark, but is a thick, cylindrical body, consisting of a great number of long broad leaves wrapped round each other, the outer ones serving as a rind to the others. It arrives at its full height in about nine months, and is about ten or twelve inches in diameter. This plant requires a moist, rich, and solid land, and if these be wanting ceases to prosper, and gives an inferior kind of fruit. Before it is ripe it is boiled like turnips with meat, and is eaten after this method by sailors and fishermen. It is also roasted on coals, and used by the negroes instead of bread. When boiled in wine with sugar and cinnamon, it assumes a beautiful red colour, and acquires a delicious taste and fragrant smell; and is one of the best preserves which the Creoles make. Of plantains there are four species, distinguished by the names of bananas, guanas, dominicos, and cambures.

55. Of the vegetables, there are none (after the manioc and the papas, or potatoes), more used for the subsistence of the common people than the oca (oxalis tuberosa), the batate and the igname. The first of these grows only in the cold and temperate climates, or on the summit or declivity of the Cordilleras; and the others belong to the warmer regions of the valleys and sea-coasts. The igname or dioscorea alata, like the banana, appears indigenous to equinoctial regions. The account of the voyage of Aloysio Cadamusto (Cadamusti Navigatio ad Terras incognitas. Grynæus Orb. Nov. p. 47), informs us that this root was known by the Arabs.

56. Among the most useful plants proper to this continent, the cacomite, or oceloxochitl, a species of tigridia, of which the root yielded a nutritive flour to the inhabitants of the valley of Mexico; the numerous varieties of love-apples, or tomatl (solanum lycopersicum), which was formerly sown along with maize; the earth-pistachio, or mani (arachis hypogea), of which the root is concealed in the earth, and which appears to have existed in Cochin China (see Loureiro, Flora Cochinchinensis, p. 522,) long before the discovery of America; lastly, the different species of pimento (capsicum baccatum, c. annuum, and c. frutescens), called by the Mexicans chilli, and the Peruvians uchu, of which the fruit is as indispensably necessary to the natives as salt to the whites. The Spaniards call pimento chile, or axi (ahi). The topinambours (helianthus tuberosus), which, according to M. Correa, are not even to be found in the Brazils, are not known to be cultivated elsewhere on this continent, though, in all our works on botany, they are said to be the natives of the country of the Brazilian Topinambas. The chimalatl, or sun with large flowers (helianthus annuus), came from Peru to New Spain; and was formerly sown in several parts of Spanish America, not only to extract oil from its seeds, but also for the sake of roasting it, and making it into bread. Rice (oryza sativa) was unknown to the people of the new continent, as well as to the inhabitants of the South Sea islands. Whenever the old historians use the expression small Peruvian rice (arroz perquenno), they mean the chenopodium quinoa, which is very common in Peru and the beautiful valley of Bogota. The cultivation of rice, introduced by the Arabs into Europe, and by the Spaniards into America, is but of little importance. The great drought which prevails in the interior is by no means favourable to its cultivation.

57. Almost all the garden stuffs and fruit-trees of Europe are now common in South America, and it is not easy to say which of the former existed in the new continent before the arrival

of the Spaniards. The same uncertainty prevails among botanists as to the species of turnips, sallads, and cabbage cultivated by the Greeks and Romans. The Americans were always acquainted with onions (in Mexican xonacatl), haricots (in Mexican ayacotli, in the Peruvian or Quichua language perutu), gourds (in Peruvian capulla), and several varieties of cicer; and Cortes, speaking of the eatables which were daily sold in the market of the ancient Tenochtitlan, expressly says, that every kind of garden-stuff (legume) was to be found there, particularly onions, leeks, garlic, garden and water cresses (mastuerzo y berro), borrage, sorrel, and artichokes (cardo y tagarninas). No species of cabbage or turnip (brassica et raphanus) was cultivated in America, although the indigenous are very fond of dressed herbs. It appears that the Mexicans had originally no peas; and this fact is the more remarkable, as our pisum sativum is believed to grow wild on the north-west coast of America. In general, if we consider the garden-stuffs of the Aztecs, and the great number of farinaceous roots cultivated in Mexico and Peru, we see that America was by no means so poor in alimentary plants as has been supposed by some learned men, who were acquainted with the New World only through the works of Herera and Solis. The degree of civilization of a people has no relation with the variety of productions. Hence we must not be astonished at not finding among the Mexicans of the sixteenth century the vegetable stores now contained in our gardens. The Greeks and Romans even neither knew spinach nor cauliflowers, nor scorzoneras, nor artichokes, nor a great number of other kitchen vegetables.

58. The central table-land of New Spain produces in the greatest abundance cherries, prunes, peaches, apricots, pine-apples, figs, grapes, melons, apples, and pears. In the environs of Mexico, the villages of San Augustin de las Cuevas and Tacubaya, the famous garden of the convent of Carmelites at San Angel, and that of the family of Fagoaga at Tenepantla, yield, in the months of June, July, and August, an immense quantity of fruit, for the most part of an exquisite taste.

59. The maguey, so abundant in every part of South America, is much esteemed by the Indians, because it supplies them with water, wine, vinegar, oil, balsam, honey, beams for building houses, tiles, thread for sewing and weaving, needles, and with its shoots for victuals. It may be classed with the aloes. The leaves, when half roasted, afford a quantity of liquor something sweet, which, when boiled to a syrup, is an excellent remedy for cleansing old wounds. It may also be taken in the quantity of half or a whole drachm, in warm water, to dislodge any crudity from the stomach, and to expel bile or extravasated blood. This plant is very abundant; and is sometimes employed in making pulque, a sort of liquor, which is the common drink of the South American Indians. When the tree is eight years old they cut the corazon, or bundle of central leaves, and insensibly enlarge the wound, covering it with lateral leaves, which they raise up by drawing them close, and tying them to the extremities. In this wound the vessels appear to deposit all the juice which would have formed the colossal hampe loaded with flowers. This is a true vegetable spring, which keeps running for two or three months, and from which the Indian draws three or four times a day. We may judge of the quickness or slowness of the motion of the juice by the quantity of honey extracted from the maguey at different times of the day. A foot commonly yields in twenty-four hours four cubic decimetres, or 200 cubic inches (242 cubic inches English), equal to eight quartillos. Of this total quantity, they obtain three quartillos at sun-rise, two at mid-day, and three at six in the evening. A very vigorous plant sometimes yields fifteen quartillos, or 375 cubic inches (454 cubic inches English), per day, for from four to five months, which amounts to the enormous volume of more than 1100 cubic decimetres, or 67,130 cubic inches. This abundance of juice produced by a maguey of scarcely a metre and a half in height, or $4\frac{2}{10}$ feet, is the more astonishing, as the agave plantations are in the most arid grounds, and frequently on banks of rocks hardly covered with vegetable earth. The value of a maguey plant near its efflorescence is, at Pachuca, five piastres, or £1. 2*s*. 4*d*. In a barren soil the Indian calculates the produce of each maguey at 150 bottles, and the value of the pulque furnished in a day at from ten to twelve sols. The produce however, like that of the vine, is unequal. Plantations of the maguey are found in New Mexico, which bring in annually nearly £2000. sterling. The cultivation is an object of such importance for the revenue, that the entry duties paid in the three cities of Mexico, Toluca, and Puebla, amounted in 1793 to the sum of 817,739 piastres, or £178,880 sterling. The expenses of collecting were then 56,608 piastres, or £12,383 sterling; so that the government drew from the agave juice a net revenue of 761,131 piastres, or £166,497, or more than 3,800,000 francs. A very intoxicating brandy, called Mexical, is formed from the pulque. The grape of the best quality is that of Zapotitlan, in the intendancy of Oaxaca. The wine of Passo is in great estimation.

60. The Spaniards, who first learnt from the Indians the method of decocting the fruit of the cacao, have since diffused this knowledge amongst other nations. Herera, the historian, compares the leaves with those of the chestnut-tree; the plant is so delicate that, to preserve it from the rays of the sun, they always set it near some tree which is capable of shading it. The flower is white, and produces fruit twice a year, in a pod grooved like a melon, and covered with a white skin in the bud of each flower; each one contains from twenty to fifty nuts compactly set, and of the size of large almonds. There are two kinds of cacao, the wild and bitter, which the Indians used to prize highly, and, as it is still in some repute, they endeavour to cultivate and improve it; the other is distinguished by its quality according to the soil or country in which it grows. The best cacao is produced in the province of Soconosco, but very little is brought to Europe. The second,

in point of goodness, is that of Machala and Ironcoso, in the province of Guatimala; the third, that of Motina, in the same province; the fourth, that of Rio de la Magdalena, in the kingdom of New Granada; the fifth, that of the island of Trinidad; the sixth, that of Caracas, in the province of Venezuela; and the seventh, that of Guayaquil. Europe is chiefly supplied from the abundant crops of the two last places, where the cacao is nearly the only fruit they cultivate. The butter extracted from the cacao is very fresh, and is applied to various purposes in medicine.

61. The vanilla is a plant of the thickness of a small vine branch, the fruit of which forms a considerable branch of trade. It is analeptic, cephalic, and stomachic, and is mixed with chocolate to give the latter an agreeable flavour. The English esteem it as a specific for hypochondriacal diseases. All the resinous substance may be extracted, and a few spoonfuls of this essence will improve the colour and taste of spirituous liquors. The herb of Paraguay, so called from the province of that name, is an odoriferous shrub, of which there is an incredible consumption throughout the kingdom of Peru, being the herb of which they make their mate. The trees, which form themselves into very thick woods, are more than 100 leagues from the capital. The neighbouring people lay the leaves on plates to be dried by fire, and rub them with the hands till they are nearly as small as steel filings, pack them up in bags of seven or eight arrobas, which they send to Peru or Chili. According to Don Casme Bueno, the quantity gathered annually exceeds 12,000 arrobas. The herb is of two kinds: one, called camini, which is the most tender part of the leaf and falls off first, is the finest and most esteemed; the other, called yerba de palos, is somewhat coarser, and contains the fibres and stalks of the leaves.

62. Among the herbs for dyeing, which are exceedingly numerous, the most remarkable are the anil, or indigo, and the cochineal. The latter, however, is not a plant, but an insect growing upon a plant called nopal; which, with the exception of the leaves, resembles in every respect the tunas of Andalusia. The insect in shape resembles the lady-bird, and when arrived at its full size is no larger than a flea. It feeds and lives on the nopal, and deposits its eggs on the leaves. The juice of this plant, which is its only moisture, is converted into its own substance, and, instead of being fluid and aqueous, assumes a beautiful carmine hue. In the months of May and June the plant is in the most vigorous state, and this is the most favourable time for depositing on the leaves the almost imperceptible eggs, a task which the Indians perform with wonderful patience; and in the short space of two months it arrives at the state we have mentioned. It is, however, exposed to a multiplicity of dangers; the northern blasts and violent showers of rain carry away the eggs, and the frost withers and destroys the leaves; nor are there any other means of preventing these calamities, than by making fires at some distance and filling the air with smoke. They are also endangered from different birds which hunt after them, and also from the grubs engendered in the nopal. When the insects have attained their full size they are gathered into glass vessels, when they die and are put into bags. The Indians have, nevertheless, three different methods of killing them; one with hot water, another by fire, and thirdly, by exposing them to the sun; and hence proceed the different degrees of colour, which is sometimes dark, at others very lively. A knowledge of the proper time when they ought to be taken off the leaves is necessary to preserve their quality. The cochineal, in some respects, may be compared with the silk-worm, particularly in depositing its eggs. The insects reserved for this purpose are caught at their full growth, and put into a box tightly closed, where they deposit their eggs and die. The boxes are kept shut till the time for placing the eggs on the nopal, and the quantity contained in the shell of a hen's egg is sufficient to cover a whole tree. The insect does not injure, in the smallest degree, the plant on which it feeds, only extracting from between the slender tegument of the leaf the most succulent part of the juice. The principal places in America in which the cochineal is cultivated, are Oaxaca, Xaxcala, Cholula, New Galicia, in the kingdom of Mexico, in Guatimala, and Chiapa, in Loxa and Ambuto, in the kingdom of Quito, and in Tucuman, and in some other provinces of Peru; but the greatest quantity is produced in Oaxaca.

63. The indigo plant is about two feet high, and has round leaves: the nil which is extracted from the leaves, differs from that which is procured from the branches; the first kind is distinguished by the name of Serguise, from the village where it is prepared, situated a few leagues from Surat, in the East Indies. The nil is prepared in the following manner: when it begins to lose its foliage the plant is cut, and the collateral branches stripped off, put into a sufficient quantity of water, and left in infusion from thirty to thirty-six hours; afterwards the vessel is somewhat inclined, so that the water, which has already assumed a green colour, almost approaching to blue, may ooze into a vat; then with poles, in the form of a pestle, capped with iron, it is agitated and churned till the surface is covered with scum. In this state they infuse one pound of oil of olives for the liquor extracted from seventy pounds of nil. After it has undergone this operation, the scum, which resembles the froth of milk, is taken off, and the liquor is left to settle. When it has remained in this state a competent time, the cock is opened, and the water runs off, leaving the dregs in the bottom like lees of wine. The sediment is then put into small linen bags till the water ceases to flow. Finally, it is placed in shallow wooden boxes, and the nil is prepared. When the top of the nil is covered with a dark violet colour, it never fails to be good. The second species is prepared in the same manner as the former, with the exception, that the leaves and branches make part of the composition. The best kind comes from Guatimala. That which comes from St. Domingo has not such a lively colour, yet for its quality it holds the second rank; that of Jamaica the third; and that from the Windward Islands the fourth; all of which are esteemed in proportion to their

cleanness and purity. In New Spain they call the plant guiquiliti; or, more properly, huiquilit. The membraneous mica, otherwise nursery-grass, is also found here in the greatest perfection, both with respect to its transparency and the size of its lamina. The country people make artificial flowers of it; and, like the Russians, use it for windows.

64. An immense number of the trees exude gums of a resinous, mucilaginous, and balsamic nature; among these may be enumerated the liquid ambar styracifluum, of two species, the croton sanguinium, yielding the gum called dragon's blood, and of which there are three species,—the dividivi, a tree like the tamarind, and affording an excellent black dye; the storax officinalis, exuding through its pores a fragrant gum of this name, which is used for incense in churches and is also of use in pectoral complaints; the aloes, of great medicinal virtues, and of which there are seven or eight species; the anime, called by the French curbaril, which, dissolved in spirits of wine, has been found effectual against the gout and nervous complaints; and the sarsaparilla, the sassafras, and the guaiacum, an infusion of which is often used for purifying the blood, and which has been found peculiarly efficacious in venereal complaints.

65. The famous balsam of Tolu takes its name from a town so called. It is a resinous, dry, solid gum, of a bright yellow colour, of an agreeable scent and good taste, in which last particular it differs from other balsams. It is procured by incision from a tree resembling a small fir, whose leaves are always green. This balsam is greatly esteemed and is brought into Europe in small cocoa-nut shells about the size of a lemon, and possesses the same virtues as the balsam of Gilead. The Peruvian bark, so famous at present for curing intermittent fevers, is peculiar to this country. It is distinguished into three kinds,—red, yellow, and white, but the red is found to be the best and most efficacious. The Jesuits carried this bark to Rome as early as 1639; but the natives are supposed to have been acquainted with its medicinal qualities many ages before. The calaquala, the decoction of which is the most powerful specific known for extracting bad humours; the accinchinali, of wonderful virtue in dissolving and expelling extravasated blood, and healing internal wounds; the maguey and guayaba, of similar virtues; the canchalagua and the culen, both extraordinary fine vermifuges, the former being also a good antiscorbutic, and useful in the quartan ague, not to mention others indispensible in our pharmacopeia, as jalap, tobacco, ginger, pimento.

66. In the southern provinces, where the moisture of the climate is aided by the warmth of the sun, the woods are almost impervious; and the surface of the ground is hid under a thick covering of shrubs, herbs, and weeds. In other parts the trees are generally more lofty, and often much larger than are to be seen in any other parts of the world. The trees are often so thick as to afford 600 planks, each of twenty feet long and of one foot and a half in width; and some have measured twenty-four yards in circumference. In Chili alone there are known ninety-seven different kinds of trees, only thirteen of which shed their leaves; amongst the plants of that kingdom there are 3000 not mentioned in botanical works. Of all the trees in America the largest is the ceiba (bombax ceiba); it produces a sort of white wool, very fine and soft, which they apply to several purposes. Of the tree they make boats of one entire piece. In Darien is a hollow tree of this species, in which twenty persons have sat down to dinner. The quebrachs, or break-hatchet, takes its name from its excessive hardness; there are two species, red and white. In Buenos Ayres they make of this wood axle-trees for the carts.

67. The mangle is a tall, bulky tree which grows spontaneously near the sea-coast; the wood is very strong and straight, and therefore much used in building houses. Lemori says there are three species; the largest is twenty-five feet high and twenty inches in diameter. The manner in which this tree grows is very astonishing; from the branches which are flexible, high, and long, there issue small bunches of filaments, which reach the ground, spread, and strike, and in a short time become as large as the tree from which they proceeded; in this manner they increase in such a degree that whole woods spring from a single tree. The wood of the mangle is solid and heavy, has very long close grains, and is used in making boats; the leaves resemble those of the pear tree, the flowers are small, and are succeeded by berries similar in outward appearance to those of the cassia, filled with a bitter pulp. The root is soft, and is used by fishermen to cure the bites of venomous animals. These trees are so thick, and their roots so interwoven, that in many places you may walk twenty leagues without touching the ground.

68. The maragnon is the size of an apple-tree; the fruit is acid and fibrous, and extracted by suction: they make furniture of the timber. The mata-palo, in the beginning, is only a shrub or twig, always growing near some other tree, round which it entwines, and, by its malignant influence, deprives it of all its sap. Some are twenty geometrical feet in circumference, and are made into canoes. There are five species of mata-palos, which bear a near resemblance to each other. The pinus cupressoides of America much resembles the European fir, but is of a distinct species. It sometimes measures ninety feet in circumference. The wood is used in building on account of its durability, and is transported from the island of Chiloe. One of these trees contains, in general, from 600 to 800 boards, twenty feet long and half a yard broad.

69. The Brazil wood derives its name from the country in which it grows. It is of the best quality, in the province of Pernambuco. The tree is large, crooked, and knotty; the leaves are of a beautiful red, and exhale an agreeable odour. The bark is so thick, that a tree as large as a man's body with the bark, will not be so thick as the leg, when peeled. The wood, cut into large pieces, without the rind, is a considerable article of commerce. When cut into chips, it loses the pale colour which it before had, and becomes red, and, when chewed, has a **sweet**

taste. It is used for various purposes by cabinet-makers, and admits of a beautiful varnish; but its principal use is in dyeing red: a sort of liquid lac is made of it (or carmine), for painting in miniature. A great deal of mahogany is found about the bay of Honduras, and the isthmus of Panama. From that procured at Panama are made tables five yards long and two and a half broad of one board. When grown on a barren soil it is hard and of a close grain, and more finely variegated than when it proceeds from damp lands. The lignum vitæ, chiefly peculiar to the island of Jamaica, is found on this continent; one species of it is found in China.

70. The minerals of South America form one of the most important and distinguishing features of this continent. Its mines of silver and gold have already been described; besides which it abounds in copper, lead, tin, quicksilver, brimstone, loadstone, and coal. Iron mines are rare. The quicksilver necessary for the working of the metals is abundant in Chili.

71. The piedra de cruz, or stone of the cross, very much resembles green marble, and is chiefly found in the kingdom of Granada. In whatever direction this stone be broken, it displays a black cross perfectly drawn, and it is said by the natives to possess singular virtue in curing the rheum and fevers. The great abundance of this stone makes it of little value. M. Bomare says that it appears to be a sort of madrepore fossil, whose veins cross each other in such a manner, that, whether they are cut horizontally or vertically, there is the figure of a cross-nature filling up the spaces with a hard argillaceous earth. The same stone is found in Portugal, Santoigne, Normandy, and Guienne, and particularly near Santiago in Galicia; and the Spanish silversmiths enchase them in gold and silver. The girasol is also a precious stone, found in Granada, partly transparent and partly opaque. It has a milky look, emits a weak lustre blended with blue and yellow, and it sometimes has the colour of the rainbow, or a gilt colour. When cut in the form of a sphere or semi-sphere it reflects the rays of light every way, but not so well as the opal. It is uncertain whether this stone be a species of the opal or calcedonia. The most beautiful are of a milk-white colour, shaded with blue and yellow beautifully intermixed. This stone, which is harder than the opal, is brought from the east, but those of a softer nature from the west. They are to be met with in the island of Cyprus, Galicia, Hungary, Bohemia, as well as in several parts of America. Sometimes they are found together, with the opal enclosed in another red tender stone, clouded with black. The name girasol was given to this stone by the Italians. There is a green stone called chalchihuites, found in the silver mines in the kingdom of New Galicia, to which they attribute the virtue of alleviating the pain of the hip-gout, or sciatica. The ancient Americans held these stones in great esteem. The most esteemed are green, of which there is a large altar-stone in the cathedral in the town of Puebla de los Angelos.

72. On this continent is also found in the sand on the shore of the island of Dominica, a small stone, shaped like a lentil, which they call limpia-ojos, or eye-cleaner. The mineral naptha is of a liquid consistency, clear, pellucid, of a strong scent, and very inflammable, and when pure burns without leaving any residuum. It is found in large quantities on the surface of fountains, at the foot of some mountains in Persia, Tartary, and China; and, if a light be applied to the surface of the water, it burns for a considerable time, emitting a very offensive smell. Genuine naptha is very scarce in Europe. In America it is found in the province of Piura, in the kingdom of Peru.

73. Of the aetites, or eagle-stone, well known in Europe, there are great quantities in Peru, particularly in the province of Huamalies. This stone is of a ferruginous nature, and has a cavity within, sometimes full and sometimes empty, and of various figures. Some are round or oval; others again are of a triangular, square, or flat form: the superfices are sometimes smooth and sometimes rough. The huano, which, according to prevalent opinion, was esteemed as the dung of a bird of that name bred in the small islands situate in the South Sea, is now incontestibly proved to be a fossil earth; and is used to fertilize the land in the province of Costa. One handful of this earth, strewed about the roots of a plant of Indian wheat, makes it grow with such vigour, that it produces two hundred-fold. In this manner an incredible quantity of this fossil is consumed. There is also another earth found here very analogous to the kaolin of the Chinese; and another kind called kovo, producing an excellent black dye, is found in Chili, represented by Feuille and Frazier as superior to the best European blacks.

74. The quadrupeds of America are as numerous, in proportion, as any other part of the living creation. Those introduced from Europe have increased and multiplied beyond all example, so that in the provinces of La Plata, in particular, it is impossible for any one to distinguish what animals do or do not belong to himself; and thus each, when he wants horses, goes out and catches as many as he wants, or kills as many oxen as he requires. The goat has thriven very well, but the sheep have degenerated, and their wool has become extremely coarse, excepting in Chili. The horses and mules are sure-footed and active. The horned cattle have acquired much in point of size, while their flesh has become more palatable and nutritive. The sheep breed twice a year, and generally have twins; and their fleeces yield annually from ten to fifteen pounds of wool each.

75. It is remarkable that none of the ferocious animals found here assimilate to the lion, the tiger, the wolf, &c. of the old continent. Though under the influence of a similar climate to Africa, even the climate of Peru and of Caracas produce nothing more like the lion than the puma (felis onza sive jaguara), being equal to its prototype neither in size, fierceness, colour, nor mane. Its head has some resemblance to that of the lion and tiger, but the tail is shorter than that of either of those animals; it climbs trees, is both timid and cowardly, and flies at the sight of a man. Modern naturalists place this animal in the genus of the felices, and in the species of

jaguara, which they believe is the ounce of the ancients.

76. The beast most resembling the tiger is the cunaguaris (felis onza), found chiefly in the province of Guiana; it resembles that animal in its shape, actions, and dispositions, and can only be distinguished from it in the size, which is less, and in the difference of the ground brown colour of the spots. It is also called cat, and lobo cerbal, or hart-wolf; it is very much like the wild cat, and of the size of a common dog; it feeds on prey like the tiger, and may be tamed if taken young; but it is always necessary to have it chained during the night, or it would destroy the hens and turkeys. Of all the quadrupeds pertaining to the order of wild beasts, the mochilera (dilelphis marsupialis), is perhaps the most peculiar to South America. These animals have ten fore teeth in the upper mandible, and eight in the lower; the grinders are large, and the tongue grained; and it has a pouch, formed by the folding of the skin of the belly, in which it preserves its young, and opens and shuts at pleasure by means of the union of several muscles, and of two bones situated before the pubis. The interior of this pouch is filled with small glands containing a yellow substance, which gives the whole body a fetid smell, but when taken out and dried loses this nauseous odour and acquires that of musk. This animal is a native of South America, and the female, it is said, brings forth five, six, or seven at a birth; and that as soon as they are born she deposits them in her pouch, and continues to suckle them in it till they can walk. When the young are frightened they instantly shut themselves up in the pouch. The motion of this animal is so slow that a man may easily catch it without running; but they climb trees with great facility, and hide themselves in the leaves, or hang by the tail from the branches. It is a carnivorous animal, but feeds occasionally on fruit, sugar-canes, and leaves. There are five species, which differ from each other merely in point of size, and are found in almost every part of America.

77. The anta (tapir bris), also peculiar to America, is about the size of a calf of two months old: it has neither tail nor horns; its head is large and fleshy, the trunk strong and nervous; eyes small, legs short, and body arched like a hog. It inhabits the mountains and dry places, and is a great friend to cleanliness; when hard pressed by the dogs it makes to some river, and swims with amazing rapidity till it finds a safe asylum on the opposite banks. Its aversion to light makes it retire into the thickets. Its hide is ball-proof, and its flesh insipid, yet the Indians eat it, and, when young, is by some esteemed delicate. It is found in every part of America, and is sometimes tamed. The Brazilians call it tapir; the Peruvians ahuara; the Portuguese anta; and the Spaniards danta, or great beast. Many have erroneously inferred, from the multiplicity of names, that there are two distinct species. But the most ferocious animal found in these regions is the famacosio (felis famococius) chiefly in Paraguay. In figure and bulk it resembles the mastiff, and its head is like that of a tiger; it has no tail: in swiftness and ferocity it is matchless. If any person comes within view of this animal he may reckon himself as become a prey to it, unless he have the opportunity of climbing into a tree to evade its pursuit. When thus disappointed the animal rears his fore feet against the tree, and roars hideously till others come to his assistance; then they gnaw the tree about the root till it falls to the ground, and if the distressed fugitive has no arms, his death is inevitable. To diminish them the Mannacicas Indians, where they are most abundant, enclose themselves in a circumvallation of palisadoes, and begin to bellow till these animals, attracted by their cries, crowd to them, and begin to gnaw the stakes to find an entrance. Whilst they are thus employed, the Indians shower their arrows upon them with such skill and dexterity, that they never let one escape. In this manner they kill great numbers.

78. In Guiana is found the rabo pelado, or naked-tail, a ravenous animal of the vulpine species, naturally ferocious, though it principally feeds on birds, and seldom appears abroad in the day. The females have under the belly a sort of pouch, hairy in the inside and close, in which they nurse and carry their young, which are generally attached to the paps enclosed within the pouch, and do not quit their hold till they can follow the mother. According to William Pison there are two other species, less than the one described. The most rare species is about the size of a young cat of two months old, and is distinguished by a bag at the bottom of the neck, which it fills with maize.

79. There is an animal of the pig kind, the sus tajacu of Linnæus, called the pig of the woods, which has an aperture on its back, from which, when closely pursued, it emits a most intolerable stench. If, on killing the animal, the part be instantaneously cut out, the flesh affords good eating; but should that operation be neglected, even for a short period, the taint contaminates the whole carcase. The domestic pigs are by no means good, for they feed so much upon beef that their flesh is very hard and coarse. There is an animal of the opossum kind, about the size of a rabbit, called a zurilla, the skin of which, streaked black and white, is considered valuable. When attacked it ejects a fetid liquor of so pungent a nature, that if it falls on any part of the dress of its pursuers, there is no possibility of getting rid of the stench but by some months exposure to the weather. The zurilla is very fond of eggs and poultry, and sometimes enters a house in quest of its prey; the inhabitants immediately hasten out and leave him in quiet possession, knowing that the slightest attempt to drive him out would expose them to the disagreeable catastrophe already alluded to.

80. The alpaca, which may be esteemed a subaltern species of the camel kind, is a quadruped peculiar to Peru and Chili; it differs from that animal only in its size and compactness. The neck is long, the head small, the ears large, the eyes round and big, the beard short, and the upper lip a little open. Its legs are rather long in proportion to its bulk, its hoof cloven, and its tail long; its hair is long, and rather coarser than that of the vicunna: in

the parts of generation it also resembles the camel, male and female. Like that ruminating animal, it has four ventricles. The second contains, between two ventricles of which it is composed, a number of cavities calculated to deposit water. This animal, like the camel, is domable, and will carry from seven to nine stone; it will fall on its knees for the convenient reception and exoneration of its burden. The disposition of the hoof, and the closeness of the hair, will admit neither shoe nor harness: they are slow, but sure-footed. It has a great thickness of fat between the skin and the flesh; and so great is the fluxion of blood in its veins, that the most intense colds are incapable of penetrating it; the enormous load of fat with which it is endowed prevents the blood from being consumed by the excessive heat of the sun. In the ventricle are formed five bezoar stones. The under mandible, like that of the camel, is furnished with six incisors, two canine teeth, and several grinders; but in the upper jaw the two first kinds of teeth are wanting, in which respect it differs from the camel kind. The ears are pointed, and better made than those of the camel; its nose is simple, its neck straight and well-proportioned, its tail beautiful, and adorned with long hair as soft as wool; it makes a noise like the neighing of a horse. When irritated it neither assails with its mouth nor heels, but ejects from its nostrils some viscous matter on the offender, which some have erroneously asserted creates the itch.

81. The vicunna. though considered by Count Buffon to be the alpaca in its wild state, is an animal of a different species, though of the same genus; and, though inhabiting the same mountains, they are never found in each other's company. The vicunna rather resembles the goat than the camel. Its wool is greatly esteemed in Europe, and is made into very fine cloth. The vicunnas are very abundant in the Cordillera of the Andes; and live on the most steep, craggy parts of those mountains. They have not been reared well in any part of Europe. They feed in flocks, like goats, and no sooner see a man than they escape with great velocity, driving their young before them. The hunters join in large bodies, surround some hill on which they are known to feed, and following them gently, they drive them towards some narrow passage, over which they have previously drawn a rope, on which they hang bunches of old rags: as soon as the vicunnas, which are naturally timid, see these they are alarmed; and huddling together, they permit the hunters to catch, sheer, and kill them.

82. The alco, or native dog of the new hemisphere, does not seem to have differed greatly from that of the old, except that it possessed not the power of barking. The natives of St. Domingo accounted their flesh a great delicacy. The number and variety of the canine species are very great in various parts of this continent; and the monkey tribes are found in all the variety known in any part of the globe.

83. The woods and groves of South America abound with various birds of exquisite plumage and melodious voices, many of which are not known in the Old World. The trillis, or thrush of Chili, has a note equally harmonious with that of the European; but always pines and dies if confined in a cage. There is a curious bird which they call in Peru the predicador, or preacher, from its imitation of a person preaching, in its natural action and gestures; its flesh is very good to eat. The mono has the extraordinary talent, in its warbling, of imitating the voices of men, dogs, and all other animals; but what is still more singular is, that not possessing the means of defending itself from its enemies, on account of the shortness of its beak and claws, it searches protection in the company of wasps, with whom it lives in the strictest union, and builds its nest in such a manner that they may defend it. This bird may perhaps be the same with the cuchucho of the Portuguese. There is another bird which the Spaniards call the organ, from its imitation of that instrument; and another the trumpeter, from a similar power of imitation. The curiquinqui, or Inca's bird, is larger than a hen, and considered the domestic fowl of Peru. It spends the whole day in clearing the fields of insects, and returns home to sleep in the evening. It is a mortal enemy to the snake, which it attacks, opposing its wing as a shield to guard against the sting; and having killed the snake it separates the head from the body and eats it. Eagles, both of the gray and blue species, as well as other birds of prey, are found here in great numbers. Here are also paroquets in immense flocks, pigeons, great red-legged partridges, small partridges, wild ducks, and wild turkeys. Ostriches of a large species are very numerous; they are so fleet and active that even when well mounted it is impossible to get near them but by surprise; the stroke of their wing is said to be inconceivably strong.

84. The condor of America is said by Molina to differ in colour only from the vulture of Switzerland, called laemmer geyer; this immense bird, the largest hitherto known, builds its nest on the rocky prominences in the most rugged parts of the mountains. They lay two large eggs, far exceeding in magnitude those of the turkey. Their usual food is the flesh of animals: they frequently attack flocks of sheep and goats, and will kill calves a year old. To effect this several of them unite, and besetting the calf on a sudden they surround it, with their wings extended, and pull out its eyes that it may not escape, when they tear it to pieces in a moment. The peasants, who watch every opportunity of destroying these aerial pirates, wrap themselves in the skin of an ox newly slain, and lay themselves flat on the ground; the condor, deceived by the appearance, thinking it some dead body, approaches the peasant, who immediately seizes their legs with his hands, which are protected with strong gloves. As soon as the bird is seized, other peasants, who had lain in ambuscade, run to assist in securing and killing the captive. Others make a small enclosure with palisadoes, and place in it the carcase of some dead animal: the condor, whose eye is very piercing and sense of smell very quick, immediately falls upon it, and loads itself in such a manner that it cannot rise on the wing, through

the small extent of the enclosure; otherwise, if it gets upon any eminence, it flies with the greatest ease, however much it may have eaten, rising to such a height that it hides itself entirely in the clouds.

85. The fregata, or frigate, has its name from the circumstance of its being seen soaring out at sea at the distance of 300 leagues from land, though it cannot support itself on the water. It is about the size of a hen, but has long wings, with which it skims above the surface of the water with ease, and strikes with such dexterity that it never misses its aim. It pursues other sea-fowls for the sake of the fish which it takes out of their bellies. Its flesh tastes something like the water-hen; and its grease, used as an ointment, alleviates rheumatic pains. As it always follows ships, the appearance of this bird is looked upon as a certain sign that some vessel is at no great distance. There is a small island not far from Guadaloupe, called the island of Fragatas, from the great numbers which resort thither to pass the night and to build their nests. This bird is not now very common. The tropic (phaeton æthereus) can soar as high as the frigate, but has the power of resting itself on the water, being able to swim like a duck. The Indians very much esteem the long feathers in the tail, with which they adorn their heads, and even thrust them through the cartilage of the nose to imitate mustachios.

86. Among the amphibious animals of the creation, none is more worthy of remark than the caiman, or alligator. The species found in America are different from the crocodile of the Nile, the first having no voice, whilst the latter can cry like a child. Its colour is gray, its aspect ferocious, and it is covered with a shell that is impenetrable to ball. It is timid, and flies at the least noise; but when tempted to human flesh it is voracious and daring. The eyes are situated in two prominences, which are the only part of it visible when it is in the water: it comes to land to bask in the sun and to eat: it swallows a quantity of large stones, which serve as weights in its stomach to make it sink in the water; the mouth is furnished with seventy-two teeth, the twenty grinders being in double rows in each jaw. The stomach has a strong smell of musk, extremely fetid. This animal abounds in the rivers and creeks, and along the sea-coast. The female lays at each incubation forty or one hundred eggs, like the ostrich, which she deposits in the shore, making a hole and covering them with sand, at the same time counterfeiting others, to prevent them from being discovered. But the gallenazos watch them from the trees, and, as soon as the caiman retires, they descend to pull them out and eat them. If it were not for those birds, and for the circumstance of the old alligators eating their young ones, which they do till the latter are too large for them to swallow, they would soon vie in numbers with the flies. The eggs which escape the search of the gallenazos remain in the sand forty days before the embryo arrives at a state of perfection, at which time the female returns and takes them out. Some have been seen in the rivers Guayaquil and Magdalena twenty-four feet in length.

87. The head of a full-grown alligator is about three feet long, and the mouth opens nearly the same length; the eyes are small, and the whole head in the water appears, at a distance, like a piece of rotten, floating wood; the upper jaw only moves, and this they raise so as to form a right angle with the lower one. They open their mouths while they lie basking in the sun, on the banks of rivers and creeks, and when filled with flies, musquitoes, and other insects, they suddenly let fall their upper jaw with surprising noise, and secure their prey. They have two large, strong, conical tusks, as white as ivory, not covered with any skin or lips, and these give the animal a frightful appearance. In the spring, their season for breeding, they make an hideous and terrible roar, resembling the sound of distant thunder. The alligator is an oviparous animal; their nests are in the form of an obtuse cone, about four feet high, and four or five in diameter at their bases; and are commonly built on the margin of some creek or river, at the distance of fifteen or twenty yards from the water. They are constructed with a sort of mortar, made of a mixture of mud, grass, and herbage; first, they lay a floor of this composition, on which they deposit a layer of eggs, upon this a stratum of their mortar, seven or eight inches thick, and then another layer of eggs. In this manner they proceed one stratum upon another, nearly to the top of the nest. The Indians in Guayaquil catch them with the tolete, which is a very strong piece of wood, three quarters of a yard long, sharpened at both extremities: at an equal distance from each end they tie a thong of ox-hide, which they keep in their hands, and play with the caiman with great dexterity and in perfect security; for though it can run swifter than a horse, yet, as it has no joints to assist it in turning, it is obliged to circumscribe a circle with the whole length of its body. When the animal is tired and fatigued by frequent attempts to catch them, they thrust the tolete horizontally into its mouth, placing it erect when it enters, by which means it remains fastened on both jaws.

88. The lizards, and other amphibious reptiles of that genus, found in the waters of the Orinoco and Amazons, are innumerable. The iguana, which is about a yard long, has frequently found in its inside a stone about as large as a small turkey's egg, of a pale ash colour, composed of different coats of lamina like an onion. Reduced to powder, and taken in warm water, it is a remedy against the stone. The liron, also amphibious, is small and beautiful, resembling the dormouse. Its belly is divided into two skins, which it opens and shuts at pleasure, like a doublet. These skins are interiorly lined with a soft fur, and within them the female carries six young ones, attached to the umbilical gut and to a small twisted nipple, which each young one holds in its mouth from its first formation till it is brought to light. Hence if you catch a female fifteen or twenty days gone with young, on opening the belly you may discover the six

young of the size of small mice, in the surprising state in which they are engendered thus supported. In the province of Venezuela it is called the little water-dog.

89. The manati, or sea-cow, is a large amphibious animal corresponding with quadrupeds by the junction of the fore feet at the breast, and with the cetaceous as being destitute of hind legs and feet, in place of which it has a very large tail, which spreads like a fan horizontally; the head is larger than that of an ox; the eyes are small and without an iris, and the holes which conduct to the organs of hearing only a line in diameter: it has no teeth in front, but a hard callous substance which serves to cut the grass, and thirty-two grinders; it is also destitute of a tongue. It has two fins placed near the head; the skin is an inch thick, and is covered with hair of an ash colour. Its usual weight is from 500 to 800 lbs.; the flesh is good and fresh, and tastes rather like veal than fish, and when dried and pickled is more esteemed. It is found in abundance in the Maragnon and the Orinoco. The sea-lion is more active, beautiful, and better shaped than the other phocæ, though of a roundish form, and covered with a dark-brown hair; its back, from the shoulders to the tail, is very short; the neck and head are long, like those of the goat; its mane is very conspicuous, and gives it something of the outward appearance of the African lion, and an exclusive right to be called the lion-marine, or sea-lion. The name which Admiral Anson gave it, and which Linnæus afterwards adopted, is improper. The Indian natives of Chili gave it the name of thopel-lame, or the hairy-lame. It bears a striking resemblance to the African lion, in the shape of its head and in the nose. The amphibious tortoise differs from the land tortoise in its size, deformity, and feet, which resemble the fins of a fish. The Indians, to take them, wait till they come out to lay their eggs in the sand, and then going on one side, turn them on their backs without a possibility of their being able to rectify themselves, on account of the flatness of their shell. They are from two to four feet long, two or three broad, and some weigh 400 lbs. They lay about 300 eggs at each incubation.

90. On the coast of the kingdom of Quito there is a fish called manta, found in such shoals that it has given its denomination to a considerable port. It is very large, resembling the sole; and the body is surrounded with a membrane of an oblong figure, three or four yards long and two broad, and nearly a hand in thickness. With this skin it seizes a man, of whom it is the mortal enemy, and squeezes him till he is drowned. The divers carry a knife with two edges with them, and as soon as they perceive the fish begin to cover them, before they press them tight, they take the knife and cut all round; and thus, after frequently stabbing the creature under the belly, at once kill it, and ensure their own safety. The boguilla, of delicious flavour, is common to the lake of Chucuito in Peru; it is about four inches long and three broad, and sells at six dollars per thousand. The guacarito is plentiful in the Orinoco; its great characteristic is its great partiality for blood, which is so predominant, that a few drops on the side of the canoe will draw them in shoals. The capitan is a delicious savoury fish, found in the rivers of New Granada: it is the bagra of other provinces, but those of Granada are the best. It has been remarked, that, when the bones of the head are separated, each one represents some one of the instruments of the passion of our Redeemer, forming the spear, cross, nails, &c. The bobo, or fool, is also very common, having its name from the facility with which it suffers itself to be caught.

91. The snakes of South America are large and venomous. The boa (constrictor magnus) is said to have the property of attracting with its breath birds and other animals for its prey. It is a native of America. It has 240 rings on its belly, and 60 on its tail; it is amphibious, and so large that some are upwards of thirty-six feet in length; the body is very thick, greatly resembling the trunk of a large tree; it is of a dusky pale colour, and the upper part of the back is marked with numerous spots; the tail is of a darker colour, and the sides are beautifully speckled; the head is covered with small scales, and it has a black streak a little above the eye: it has no grinders, nor is its bite venomous; the tongue is fleshy and very thin; the part above each eye is a little elevated; the scales are small and very smooth, and the tail is not more than one-eighth part of its body. The Indians adore this monster, the skin serves as an ornamental part of their dress, and by them the body is eaten. It generally lives in caverns and very thick woods, taking its station near some tree, round which it twines its tail and springs out upon any thing that passes within its reach. As soon as it has got possession of its prey, particularly if it be some large animal, it surrounds the body, squeezing it very hard to break the bones, which it readily accomplishes by the force of its circular muscles: after this is done, it passes its tongue over the skin, leaving on it a kind of saliva, to facilitate deglutition, and swallows it by degrees. If its prey be an horned animal it begins at the hind feet and finishes at the head, leaving the horns hanging out of the mouth till the body is digested, when they then fall. After it has devoured a large animal it is incapable of motion for two or three days, when the hunters avail themselves of the opportunity, and kill it. When irritated it sends forth terrible hisses. It frequently rolls in mire, and then hides itself among the fallen leaves, waiting for prey near some path frequented by wild beasts; and in this state the hunters have sometimes set their foot upon it, mistaking it for a fallen tree. This snake is found in the kingdom of Terra Firma, in the kingdom of New Granada, and in many other parts of the continent. In the province of Chaco they are called ampalabas; and by the Dutch in their colonies smugglers.

92. The flying snake is peculiar to the province of Guayaquil in the kingdom of Quito, where it is, with great reason, more feared than any other. It is about three palms in length, slender, of a dark colour, and very venomous.

The vulgar persuade themselves that it has hidden wings, which it expands when it wishes to fly; but its flight is nothing more than a contraction of the body, and the flying off like an arrow, taking incredibly large jumps. This snake is the chinchinton of Guatimala. The coral snake is a yard long, and an inch in diameter, with a beautiful skin; but its bite is instant death. The person who is bitten immediately swells and begins to shed blood from every part of his body, and, all his veins being burst, he instantly expires. This serpent is very frequent in every part of America. Bomare confounds it with the yacumana of the Amazons, but the difference between them is very great.

93. The distinguishing mark of the rattlesnake is, that it has a rattle in the end of its tail, consisting of several sounding shells, or rather a small shelly bag with a little bone in the inside, which rattles when the animal moves, and serves to warn those who hear it of its approach. It receives an increase of one bell, or rattle, every year. There are five species: the horridus, or American rattle-snake, is of a deep orange colour, or blackish on the back and ash-coloured on the belly, from four to five feet long. The second is the miliar, ash-coloured, with black spots, peculiar to Carolina. The third, the dryinas, of a whitish colour, with a few spots of yellow. The fourth, the dursisus, spotted with white and yellow; and, fifthly, the mutus, of a rhomboidal figure, with black spots on the back and a streak of the same colour behind its eyes. This last is a native of Surinam. They are found in both North and South America, where they are very numerous; the bite of any of them is so extremely venomous that it kills in a very short time.

94. Numerous kinds of insects infest every city and colony, most of them unknown to European climes. The comajen is a very diminutive insect, resembling the moth in its destructive qualities, but so very active, that, in the space of one night, it will penetrate the hardest substances; and there have been instances of its having perforated from one side to the other, in the above-mentioned time, a bale of paper, containing twenty-four reams. It is very frequent in hot rainy countries; and the greatest precaution is necessary to prevent it from entering the magazines. Tar is generally used to prevent its effects; and by Linnæus quicklime is recommended.

95. The coya is a very venomous insect, generated in the hot provinces, such as that of San Juan de los Llanos, and particularly in the plains of Aciva. It is the same shape and size as that which is known in Europe by the name of cochinilla de San Anton, or cochineal of St. Anthony. It neither stings nor bites; but if it happen to burst, and its blood touch any part of the body, except the soles of the feet and the palms of the hands, it is said to produce violent and often fatal convulsions. As this is the effect of a sudden coagulation of the blood, the ordinary remedy is to make a fire of straw, and expose the patient freely to the action of the flames. The instinct in animals which are pasturing and see one of these insects near them is very singular; they instantly snort and gallop off in another direction.

96. The mosquito de Gusana is of a cream-colour, and when it bites it leaves behind the seed of a small grub, which increases daily in magnitude. At first it is covered over with a skin, and causes very intense pain. It afterwards breaks out into a wound, and, if not properly attended to, ends in a gangrene, which puts an end to the existence of the sufferer. This insect has been extended to several provinces in which it was not formerly found, by means of the cattle.

97. The nigua is a very small kind of flea, which penetrates the stockings, and introduces itself under the nails and into the joints and top of the toes. The pain which it causes on piercing the skin is like the bite of a common flea. As soon as it has fixed its situation it begins to corrode the flesh around it, and causes a slight itching; and in this state attains the size of a small pea, and lays its eggs, which are so many other young niguas, which settle near the mother, and live in the same manner, increasing with such wonderful celerity, that if care be not taken to pull them out, they corrupt all the flesh near them, and cause malignant ulcers, and frequently gangrenes. When the bite is felt, the bad effects may be prevented by breaking the skin where the insect is situated, and extracting it with the point of a needle, putting a pinch of snuff, or ashes out of a tobacco-pipe, into the wound. The negroes, and all people who are dirty, frequently lose the use of their feet for want of dislodging these insects at the proper time; and many have been obliged to submit to amputation of the leg. Pigs are also very subject to this disease, and their feet are always full of this insect. In Peru it is called pique.

98. The centipedes here are found from three to ten inches in length, and have the power of biting with both head and tail, the wound causing a fever and violent pain. There is also a small insect called the alicuya, generated amongst the herbs of Peru, and very prejudicial to the flocks. It eats its way into the inside of a beast, settles in its liver, and causes an ulceration, of which vast numbers die. Against it salt is the best preservative. Ants, in many provinces, are exceedingly numerous; and would be intolerable, but for a quadruped peculiar to South America, called the ant-eater, which has the power of shooting out its tongue into the ant-holes, from whence, when it is covered with them, it withdraws it, and swallows them by myriads.

99. Of the indigenous worms, insects, &c. of this continent, it is hardly possible to give an exact account. In Chili alone there are thirty-six species of insects; and the tunicated cuttle-fish found here is 150 pounds weight. In the same province there are thirteen species of crabs and craw-fish found on the coast, and four species in the fresh waters.

CIVIL AND POLITICAL DIVISIONS OF SOUTH AMERICA.

CHAP. II.

100. South America, once regularly delivered over by the Pope to Spain, and for centuries divided principally between the Spaniards and Portuguese, is now occupied for the main part by a group of rising independent states, to which, therefore, we shall direct our principal attention. In Guiana, a province little known, the British possessions (comprehending all that was once called Dutch Guiana) demand a slight attention; and Cayenne is a French island off this coast, and the name of a small French settlement opposite to it. The great political divisions of South America are exhibited in the following table. Both the dimension and population of the different countries will commonly be estimated in round numbers, their exact proportions never having been very correctly ascertained

CIVIL DIVISIONS AND POPULATION OF SOUTH AMERICA.

Order.	Countries.	Square miles.	Population.	Number of persons estimated to a square mile.
1	Columbia	1,350,000	3,000,000	2
2	Guiana	90,000	250,000	2
3	Peru	495,000	1,076,997	3
4	Brazil	3,060,000	2,200,000	2 for 3 miles.
5	United Provinces . . .	1,440,000	2,400,000	1
6	Chili	175,500	1,226,000	7
7	Patagonia	400,000		

101. Columbia, at present the best established of the South American States, is situated between 5° 50′ south and 12° 30′ north latitude, and 58° and 82° west longitude. It is bounded on the north by the Carribean sea, and north-east by the Atlantic Ocean; on the east by Guiana, from which it is separated by the river Essequebo; on the south by Brazil and Peru; on the west by the Pacific Ocean, and north-west by Guatimala in North America, with which it is connected by the Isthmus of Darien. It is estimated to be 1500 miles long and 900 broad, including an area of about 350,000 square miles.

102. The Andes chain of mountains is continued from Peru along the shores of the Pacific Ocean, and, dividing near the southern boundary, run parallel with each other in a northerly direction for 200 miles, enclosing a longitudinal valley nearly thirty miles broad, and elevated 9000 feet above the level of the sea. Between the second and third degrees of north latitude, the range again divides into three separate chains, of which the eastern was called Venezuela, the middle one Santa Martha, and the western or parent range. The Venezuela chain preserves a north-easterly direction towards the southern extremity of the lake of Maracaibo, where, dividing into two great branches, it takes a two-fold direction; one range proceeding on the west side of the lake till it terminates; and the other continuing in a north-easterly direction, and winding along the northern coast, diminishes in height till it terminates on the Gulf of Paria, opposite the island of Trinidad.

103. The country east of the Andes, and south of the Venezuela chain, consists of immense plains, comprehending the vast tracts watered by the Orinoco and its branches, a considerable part of which is overflowed in the rainy season. Columbia is full of noble rivers; the largest of which, besides the Orinoco and Amazon, are the Magdalena, Cauca, Atrato, Guayaquil, and Guarapiche. It is also indented by numerous gulfs and bays, particularly the Gulf of Guayaquil, the Bay of Choco, the Bay of Panamá, the Gulf of Darien, the Gulf of Maracaibo enclosed between two peninsulas, and communicating by a mouth forty miles in width with the Carribean sea, the Gulf of Cariaco formed by a long peninsula projecting from the main land to the south of the island of Margarita, and the Gulf of Paria.

104. The lakes also contribute to the importance of this country. Lake Maracaibo is 200 miles long and 70 broad; and communicates with the Gulf of Maracaibo by means of a narrow strait well defended with strong forts. Lake Parima is generally laid down in maps a little to the east of the sources of the Orinoco. The climate varies in proportion to its elevation; but the temperature at the city of Leon de Caraccas, 8000 feet above the level of the sea, is delightful all the year, and presents an unparalleled assemblage of all the lively, grand, and picturesque features of nature.

105. The republic of Columbia is composed of the united provinces of New Granada and Venezuela, and contains the following divisions and population, viz.

VENEZUELA.		NEW GRANADA.	
Provinces.	Population.	Provinces.	Population.
Guiana	40,000	Rio Hacha	20,000
Cumana	100,000	Santa Marta	70,000
Island of Margarita	15,000	Cartagena	210,000
Caraccas	460,000	Panamá	50,000
Maracaibo	120,000	Coro	40,000
Varinas	90,000	Antioquia	110,000
		Pamplona	90,000
	825,000	Sacorro	130,000
		Tunja	200,000
		Cundinamarca	190,000
		Mariquita	110,000
		Popayan	320,000
		Casanare	20,000
		Quito	500,000
		Cuença	200,000
		Guayaquil	50,000
		Loxa and Jaen	80,000
		Quisos and Marnes	40,000
			2,430,000

106. This population consists of Indians or Aborigines, Europeans, Spaniards, and Creoles, or their descendants; Negroes, and mixed or coloured races known by the names of Mulattoes, Mestizoes, Quarterons, &c.; and with the nations of independent Indians, as the Gaahiras who inhabit the country betwixt Rio Hacha and Maracaibo; the tribes on the coast of Darien; the population of the Meta, and the tribes of the Orinoco, raise the above enumeration to upwards of 3,000,000. But even this is extremely disproportioned to the extent of territory; and could twenty millions of inhabitants be transferred from Europe they would find land to cultivate, and abundance to crown their labours.

107. The chief towns are—Santa Fé de Bogota, the former capital of the vice-royalty of New Granada, and the present seat of government, situated on the small river Bogota, a river tributary to the Magdalena; it contains about 30,000 population—St. Thomas containing 7000, situated on the south bank of the Orinoco—Leone de Caraccas, situated among the mountains, near the northern coast, in a valley considerably elevated above the sea. In 1802 it contained 42,000 inhabitants, of whom one-fourth were whites. In March, 1812, many houses were destroyed by a dreadful earthquake; and 12,000 persons buried in the ruins. La Guayra, the port of Caraccas, is seven miles north of the city in an unhealthy situation. The harbour is open to the wind, and continually agitated by the surge of the sea. The population is about 6000. Quito, which contains 70,000 inhabitants, of whom one-sixth are whites, is situated almost under the equator, on the side of the volcanic mountain Pichincha. It is subject to dreadful earthquakes. Carthagena, which contains 24,000 inhabitants, lies in seventy-six degrees west longitude, and has a spacious harbour. Porto Bello, which has an excellent harbour, on the north coast of the Isthmus Darien; Panamá, on the south side of the same Isthmus; Guayaquil, on the west bank of the river of that name. Maracaibo, on the western bank of a lake of the same name, containing 25,000 population, at least half of whom are whites. Cumana, on an arid and sandy plain near the mouth of the gulf of Cariaco, containing a population of 18,000. Porto Cabello, situated in a peninsula ninety miles west of Leon, is the commercial emporium of a considerable district: it possesses a deep, spacious, and well-protected harbour; and a population of 7500 inhabitants. Popayan is situated on the Andes in 2° 28′ north latitude, on an extensive plain, 250 miles south-west of the capital; is nearly 6000 feet above the level of the sea, and in the vicinity of two great volcanoes; population 25,000, one-third of whom are negroes. Angostura, situated on the river Orinoco, contains 7000 inhabitants.

108. The internal navigation of this republic is excellent; and several new canals have been proposed. A branch of the Rio Atrato, which falls into the Gulf Darien, approaches within five or six leagues of the Pacific Ocean. A similar project has been in agitation with respect to the country between Cruces and Panamá. A canal has been actually dug from a branch of the Rio Atrato to a small river which falls into the Pacific Ocean.

109. The commerce of Columbia, though in its infancy, is flourishing. Under the Spanish government, indeed, it was almost suppressed; the culture of the vine and the olive were forbidden; tobacco could only be raised in such quantities as the government thought proper to purchase at a price fixed by itself. The distillation of spirits was monopolized; and their

articles which were cultivated, could only be exported through the Spanish merchants. The principal articles of Columbian trade at present are cocoa, coffee, cotton, indigo, sugar, hides, cattle, and Brazil wood. The stately forests which cover the banks of the Orinoco and Magdalena, with their tributary streams, will hereafter supply Europe with cedar, mahogany, and an infinite variety of woods of exquisite beauty and durability, together with a variety of drugs, precious balsams, &c. On the coast of the islands of Margaritta was formerly a considerable pearl-fishery; there is another on the Goagira coast, betwixt Rio Hacha and Maracaibo. The pearls of this coast are remarkable for their beautiful orient or play of light, in which they are far superior to the pearls of the east.

We give the following extract from a pamphlet published at Santa Fé in 1810, 'Sobre la Constitucion de los Estados Unidos,' by Don Miguel Pombo, on the revenue of this country:

COLUMBIA.

New Granada.		Venezuela.	
Sources of Revenue.	Amount.	Sources of Revenue.	Amount.
	Dollars.		Dollars.
Value of Europ. goods an. imported	2,500,000	Annual produce of agriculture and cattle	6,000,000
—— of Exports from Guayaquil, Panamá, River Magdalena, &c.	1,150,000	Revenue arising from the same sources as that of New Granada	1,400,000
Cast and ingots of gold exported	2,650,000	Monopoly of tobacco	700,000
Tithes	800,000	Sale of bulls (abolished)	26,000
Which sum supposes an annual agricultural produce of	10,000,000	Total revenue	2,126,000
Revenue arising from		The following is an Official Return of the Port of La Guayra, from the 1st of January to the 31st of October, 1823, in dollars.	
1. The 1st and 5th part of gold extracted from rivers (abolished)			
2. Produce of all salt works about 100,000 dollars			
3. Capitation tax paid by the Indians (ab.)			
4. Produce of monopolies of tobacco and spirits (partly ab.)			
5. Bulls of crusade (ab.)	3,200,000	Import duties	515,609 0½
6. Custom-house duties		Export ditto	153,101 3½
7. Alcabala, or duty paid on the sale of every article of consumption (ab.)		Tonnage ditto	7,788 3½
		Salt ditto	5,083 1½
8. Duty on stamp paper		Anchorage	414 0
9. Pecuniary penalties		Prizes	105,552 3
10. Produce of lands belonging to the king		Duties appropriated by the military hospital	6,038 0½
11. Sale of public employment (ab.)		Total	760,576 4½

110. The return of the exports of La Guayra, during the year 1823, are as follows: Mahogany, 10 planks; cocoa, 35,426 fand. 90 lbs.; coffee, 39,341 quin. 56lbs.; indigo 189,108 lbs.; hides, 20,008; cotton, 2183; vanilla, 289 lbs.; sarsaparilla, 81 qn. 65 lbs.; calaguala, 4 qn. 50 lbs.; hellebore, 89 qn. 10 lbs.; molasses, 25 barrels; sweetmeats, 11 boxes; garlic, 1611; strings and horns, 3060. The value of the cargoes was stated at 16,483,567½ dollars, and the duties at 164,521½. Beside the above articles were exported 1146 bales of varinas tobacco, weighing 108,660 lbs.; but these having been sold at the tobacco ware house, have not been valued nor charged with duties. The revenue is badly managed, owing to the general corruption of the subordinate magistrates and agents of government, and the commerce is fettered by want of population, want of industry, want of capital, want of knowledge, and want of internal communications.

111. The manufactures of Columbia are not considerable; and Europe perhaps will, for ages, be the work shop of the new world. In Quito, and some provinces of New Granada, coarse cloths are manufactured; baizes, blankets, hats, and other articles of inferior clothing.—The value of manufactured produce in the provinces of Quito, Cuença, Casanare, Guayaquil, Tunja, Socorro, and Pamplona, amounted in 1810 to 5,000,000 dollars.

112. With respect to the arts of life, the Columbians are extremely defective. Houses of all classes are built of mud, sometimes mixed

with stones, and occasionally plastered on wattles. Architecture in most papal countries receives an impulse from ecclesiastical wealth and influence; but here no monument has been raised of this kind at all worth the traveller's attention. The façades of several churches in Caraccas were tasteful before they yielded to the earthquake, but with the exception of the cathedral of Bogota, there is no edifice worth naming. This is of yellow stone; and on the whole an imposing structure. There are twenty-nine other churches and convents, differing only in the gilding and barbarous decorations with which they are overcharged. The doors and windows of their buildings generally would be inadmissible in an English stable. Whoever wishes to build according to European ideas of decency must send to Europe for workmen, or import his house already made. The various branches of handicraft are equally imperfect; and the fine arts of course in a state of infancy. Painting is cultivated with some success in Quito: Bogota boasts the native genius of Varques. It was, however, impossible that the arts should flourish beneath the Spanish yoke, as will appear from the following fact:—Antonio Garcia, an artist of Bogota, had two paintings, from which he used to study; one of which represented Hercules spinning by the side of Omphale, and the other Endymion sleeping on the breast of Diana. The commissary of the inquisition, being informed of the circumstance, proceeded to search his cabinet, and had the pictures cut to pieces on the pretended ground that they were indecent. The inhabitants of Venezuela have great musical talent; and before the revolution this science was studied with success in Caraccas. At present it can scarcely be said to be a subject of study; but wildly scatters sweetness on its native air.

113. Education and literature in Caraccas are confined almost exclusively to the capital and Santa Fé. A college was founded by bishop A. Gonzales de Acuna, who died 1682, in which at first nothing but Latin was taught, with the addition of scholastic philosophy and theology; but reading, writing, rhetoric, philosophy, ethics, school divinity, positive divinity and theology, civil and common law, and medicine, were afterwards introduced; and sixty years after the foundation of the college an university was superadded, from which different degrees were confirmed. The oath imposed upon each rank was to maintain the Immaculate Conception, not to teach nor practice regicide, nor tyrannicide, and to defend the doctrine of St. Thomas. In this college and university there were, in 1802, sixty-four boarders, and 402 students not boarders, viz.:

In the lower classes, comprising rhetoric	202
Philosophy	140
Theology	36
Canon and civil law	55
Physic	11
In the school of sacred music	22
	466

114. Education, viewed in relation to the character of the knowledge acquired at Caraccas and Santa Fè, was widely different. The lively genius and ardent temper of the Caraccanians prompted them to the study of philosophy, eloquence, and politics; whilst in Santa Fè the several branches of natural history, botany, and mathematics, were cultivated with success, under the auspices of Dr. Mutes, Calders, Zea, and other members of the university. The course of study by law enacted was by no means propitious to the cultivation of letters, and the inquisition exercised great authority; the works of Rousseau, Voltaire and Volney, were nevertheless read, together with many other prohibited publications; and although a dancing academy was suppressed, and the jealousy of the church manifest, the Flora of Bogota commenced by Dr. Mutes, proceeded after his death under the direction of Dr. Senforso Mutes, his nephew, Don Francisco Jose Caldas, and Don Jose Lorano, aided by the pencil of Don Salvados Rezo. At present great efforts are made in favour of education; Lancasterian schools are established in several of the principal towns; the colleges and universities have their several courses of studies reformed; professorships of mineralogy and natural history have been established, and filled by French gentlemen engaged by Mr. Zea—circumstances which have induced the friends of Columbia to indulge the most pleasing anticipations.

115. The religion of Columbia is the Roman Catholic, and the priests were formerly excessively numerous, till the honours and emoluments of military and civil life drew away great numbers of the young men from the clerical office. A law was published in 1821, August 22nd, to abolish the inquisition, and to restore to the ecclesiastical courts jurisdiction in matters of religion. The third article of this law states: 'Juridical proceedings in such cases shall take place only with respect to Roman Catholics born in Columbia, their children, and those who having come from other countries shall have enrolled themselves in the parish registers of the Catholics; but not with respect to strangers who may come to establish themselves temporarily or permanently; nor with their descendants who can in no manner be molested on account of their belief, though they ought to respect the Roman Catholic worship and religion.' Toleration is thus extended to all classes; but the existing regulations, which interdict marriages between Roman Catholics and heretics, will for the present prevent the amalgamation of foreigners with the Columbian population.

116. The diseases of this climate, which reign with great violence on the sea-coast, on the borders of great rivers, and low situations, are fevers and dysenteries; the milder species assuming frequently the type of the more malignant, and ending in that species which is called 'the *black vomit*.' Intermittent fevers, putrid or bilious fevers, &c. are its common preliminaries; but dysenteric complaints, from the simple diarrhœa through all the stages of bloody flux to confirmed dysentery, constitute a class of diseases far more destructive to the Columbian population than even fevers themselves.

117. Temperance and exercise are indispensable here. Probably 8000 Englishmen have visited this country during the war, as officers and soldiers; and of these there are not now 300

survivors; and three-fifths of this loss must be ascribed to drinking spirituous liquors. An occasional debauch is often, of the two, more speedily fatal than habitual drunkenness.

118. The diseases of the mountainous and temperate districts are few, and resemble those in the north of Europe. One exception, however, we must name, and that is the malady called *papos* in this country, and goitre in Switzerland. It appears in the shape of a swelling on the throat, which rapidly increases, and often becomes larger than the head itself. It is said to be an effect of constitutional weakness; and moreover that the children of goitred parents are commonly deaf or dumb, and in the generation next succeeding entirely idiots. To so alarming an extent does this disease exist in the mountainous region of the interior, that it is said whole villages are be found in which there is scarcely an individual who does not wear this unsightly excrescence.

119. The history of Columbia now demands our attention. The republic of this name is of recent origin; but the two states, by the union of which it is composed, have had their separate histories as early as the time of Columbus; and before 1811 they were known as the vice-royalty of Granada and the captain-generalship of Caraccas.

120. The coasts of New Granada were first visited by Columbus during his fourth voyage, who with his brother landed at Cape Honduras to take possession of the new territory for the crown of Spain. After this ceremony the fleet proceeded along the shore; and being compelled by strong easterly winds to double a cape, in doing which they found great difficulty, they called it Cape Gracias á Dios. In the course of his voyage he touched at Veragua, Nombre de Dios, Belos, Porto Bello, and other places. At the first of these he sent his brother up the country in quest of gold; who returning with a great quantity, he wished to plant a colony here. Ojeda and Amerigo Vespucci followed Columbus in the work of exploration; and Vespucci gave the first regular description of the natives of Columbia. Ojeda and Nicuessa in 1508 obtained from the Spanish crown extensive grants in this district and its immediate vicinity; the former, under the name of New Andalusia, had in his charter the country from Cape de la Vela to the gulf of Darien, whilst the latter individual, under the name of Golden Castile, was to govern the territory from the gulf of Darien to Cape Gracias á Dios. Ojeda, defeated in his design, established the colony of St. Sebastian on the eastern promontory, whence from want of supplies proceeding to Carthagena, found his town on his return destroyed by the natives; and sailing forthwith to the river of Darien, they conquered an Indian tribe and founded the town of Santa Maria del Darien. Nicuessa endeavoured to establish a colony at Nombre de Dios, and was shortly after through the death of Ojeda called to assume the government, but in consequence of the dissensions of the colonists he was put into a decayed vessel and sent to sea, where he is supposed to have perished. The Terra Firma province, including both the above grants, was in 1514 conferred upon Pedro Adrias de Avila, under whose government Vasco Nunez de Balboa, who discovered the South Sea, was beheaded in consequence of a revolt. The western coast of Panamá, Veragua, and Darien as far north as cape Blanco, were discovered by order of Avila, and the town of Panamá founded. Sebastian de Benalcarar, who accompanied Pizaro to Peru in 1536, conquered and colonized the internal provinces of New Granada to the south whilst Gonzalo Ximenes de Quesada sent by Lugo, admiral of the Canaries, overran the northern districts from Santa Marta. The whole was formed into a kingdom, over which in 1547 was appointed a captain-general.

121. In 1718 New Granada became a vice-royalty. In 1724 the former government was restored, which in 1740 again reverted to the re-establishment of the vice-royalty accompanied by its numerous evils. It continued under this system till the invasion of Spain by the French, and shortly after avowed its independence by a congress delegated from the different provinces. The country has since that period passed through many vicissitudes of fortune; and the alternate triumphs of the royalists and the independents have been preceded by frightful scenes of bloodshed and rapine. In 1816 an action fought with the Spanish army under Morillo, ended in the defeat of the independents, and the dispersion of the congress. Three years of further subjection to their old masters ensued, when in August 1819 the infant state was rescued by the army of Bolivar, whose subsequent successes have been uniform and brilliant. In the beginning of 1822 the only point occupied by the Spanish armies was the isthmus of Panamá, and in December, 1819, New Granada and Venezuela were united in one republic.

122. The coast of Venezuela was discovered by Columbus during his third voyage in 1498; shortly after which, several efforts being made to colonize, the Spanish government resolved to settle the country under its own direction. When the natives were partly subdued, Charles V. sold the proprietorship to the Weltsers, a German mercantile company. Their administration being replete with abuses, they were dispossessed in 1550, and in their stead a supreme government was appointed under the title of captain-general.

123. From this period till 1806, Caraccas remained in quiet subjection to the mother-country, when an unfortunate attempt at her emancipation under General Mirando, a native, gave, at least for the time, an effectual blow to the cause of independence. In 1810, when Spain was overrun by French troops, a junta suprema, or congress, was convened in Caraccas, consisting of deputies from the different provinces with the exception of Maracaibo, who, though they at first published their acts in the name of Ferdinand VII., shortly assumed the supreme authority under the title of the confederation of Venezuela. The Spanish regency and Cortes adopted the most violent measures; but the congress nevertheless issued a formal proclamation of independence on the 6th of July 1811. Affairs now wore a favourable aspect, till the earthquake, which, operating on the deeply-rooted superstí-

tions of the people, effected a great change in the public opinion; of which General Monteverde a royalist being sensible, he marched against Caraccas, overthrew General Mirando, and compelled the whole province to submit. In 1813 it was emancipated by Bolivar, but he was defeated by Boves in 1816. He returned again and was defeated; but in the December of the same year he rallied his forces and defeated the royalists with great loss. In the month following Barcelona was taken by the Spaniards; and, affairs becoming desperate, Bolivar was invested by the congress with the ample power of a dictator.

124. On the 17th of December, 1819, an union was agreed upon between the states of Granada and Venezuela, which received the title of the republic of Columbia. The installation of the general congress took place in the city of Rosario of Cucuta, on the 6th of May, 1821. It was then and there agreed that the two states should form one nation under a popular representative government, divided into legislative, executive, and judicial. Bolivar, the president, spared no effort towards bringing the war to a speedy close; and on the 24th of June, 1821, was fought the celebrated battle of Carabobo, in which the royalist army was defeated, losing artillery, baggage, and upwards of 6000 men.

125. Brazil, including Portuguese Guiana, forms another important division of South America, situated between 4° N. and 34° S. lat. and 35° and 72° W. long. It is bounded on the north by Columbia, French Guiana, and the Atlantic Ocean; on the west by the United Provinces, Columbia, and Peru; on the east and south-east by the Atlantic Ocean. From north to south its length is about 1800 miles, and its mean breadth about 1700, the greatest part of which is one impenetrable forest.

126. The Brazilian Andes run parallel with the coast, from which they are not very distant, from 10° to 32° S. lat. with the steepest side towards the sea, and sloping towards the interior. This country, rising in the west by gentle gradations, attains the height of from 3000 to 6000 feet; where, under the name of Campos Parexis, it spreads out into barren and sandy plains, occupying the very centre of South America, and surrounding the sources of the Tapajos entirely, and the head waters of the Madera partially. It is said, that of 19,584,000,000 acres, or 3,060,000 square miles of land, included in the area of this kingdom, not more than 20,000 square miles are at present brought under cultivation, although the country is fertile and well watered.

127. The soil, especially in that part contiguous to Rio de Janeiro, is mostly of a light brown colour, containing in many places spots of a deep red cast and clayey, and by washing this last description the children obtain a small quantity of gold. In some parts the soil seems to be owing more to a decomposition of rock than any alluvial deposit mingled with a large portion of mica; also crystals of feldspar, in a decomposing state, are frequently found embedded in the soil.

128. The northern regions of this province produce cotton, sugar, coffee, tobacco, and all the common fruits of tropical climes; and amongst which may be particularized the banana or plantain, the orange, especially the esteemed species of the selecta, and the tangerinha: to this fruit the inhabitants are particularly partial in the morning, when they say it is oro (gold), at noon prata (silver), and in the evening chumbo (lead); the pine-apple, the maracuja, passion-flower, (passiflora), with large scarlet flowers and green edges, the fruit of which is so grateful and cooling; the mango, brought from Asia; the fruta do conde, or custard-apple; the grumichama (myrtus lucida); the pitanga, a small red fruit; the jambuticaba; the jamba, or rose-apple, and others. The Conde de Barca (Aurajo), who died during his ministry in 1817, procured the bohea tea plant from China, and a number of Chinese to cultivate it. This tree still covers a few roods of land, three leagues from the city of Lagoa de Freitas; but, although it produces abundance of seeds, is said by travellers to want that luxuriance of leaf or bushy appearance which it assumes in the empire of China. The soil in the immediate vicinity of Rio de Janeiro appears to be similar to that of the south of China; and when to this we add the latitude, which is 22° S. and that the tree in question flourishes as far as 30° from the line S., there can be no reason why it should not succeed. The forests of this region abound with the most useful and beautiful varieties of timber, particularly the jacarandá, a species of inga without the smell, but in other respects similar to the rose-wood of India; and a wood yet more beautiful, called by the natives Gonzalo-Alves. The pao d'alioo, or garlic tree, is extremely singular. On every side the attention is attracted by the most beautiful flowers; among which may be mentioned several varieties of bignonias, passifloras, and others, selecting for themselves warm exposed situations, or cooler retreats in the woods, and presenting a surprising magnificence, accompanied, however, with none of that sweet scent which is common in those of northern regions.

129. Minerals abound generally in the province. It is not easy to ascertain with exactness the produce of the diamond mines, as they are rented by the government. In some years the quantity discovered by the government is said to have amounted to 4000 octavos of eighteen carats; but twelve octavos is thought to be the average. These stones are equally fine with the oriental. The quantity of gold obtained from the mines, it is also difficult to ascertain, owing to the one-fifth due to government. Its annual value, however, is supposed not to exceed £900,000, including the contraband specie, which is prohibited from being carried coastwise, and renders it needful for northern traders to take bank-bills, paying a premium of from three to five per cent. The legal rate of interest is six per cent.; but money can with difficulty be obtained under twelve. In the capitania of Minas Geraes numerous precious stones are found in the beds of the mountain torrents, or in deep valleys, in a stratum of rounded pebbles or gravel; also, the head waters of the great rivers

which flow northward, and fall into the Amazons, as the Xingu, the Tapajoz, the Araguaya, and the Madeira, are fertile with gold. The diamond district extends about fifty miles from north to south, and twenty-five from east to west, around the sources of these rivers. It is under military government, and guards are stationed on all sides to examine travellers and detain suspicious persons.

130. The rivers of this province constitute another branch of its importance. The Paraguay, the Parana, and the Uraguay, rise in this territory; whence they flow into the United Provinces, opening a navigable communication from the ocean to every part of the interior. The tributaries of the Amazons, with the exception of the Tocantins, have been already enumerated. The following are the most remarkable streams which fall directly into the ocean:—1. The Parnaiba, which terminates in longitude 42° west. 2. The Rio Francisco, which, rising in the western declivity of the Brazilian Andes, near the parallel of the 20th degree of south latitude, and flowing first south and then east, a course of 1000 miles, terminates under the parallel of 11° south latitude. 3. The Rio Grande, which rises near the sources of the Francisco, and falls into the ocean a little north of Porto Seguro, south latitude 15°. 4. The Doce, which rises near the town of Villa Rica, in south latitude 21°, and falls into the sea about 19° 30′. 5. The Paraiba, which pursues a north-easterly course along the foot of the eastern declivity of the mountains for 150 miles, and falls into the ocean in south latitude 22°. 6. The Rio Grande, the second of the same name, and empties its waters in latitude 32° south.

131. The climate of this country is healthy, but greatly diversified in temperature. In some places the heats are great, but tempered by a humid atmosphere and by the mountains; and in the southern parts it is mild and temperate, the thermometer seldom falling below 40°. As the northern parts of Brazil are situated near the middle of the torrid zone, there is little variation in the seasons, and the days and nights are nearly of the same length; the sun declines only a few degrees from his vertical position; the trees never lose their foliage; nor is the ground ever destitute of flowers. Many of the plants and trees are adorned with the most beautiful flowers, which, being intermixed with leaves of the brightest green, impart to the forests of these regions a splendour unparalleled in the torrid zones. Near the shores of the Atlantic the refreshing influence of the trade-winds is constantly felt. In short we may adopt the language of a celebrated author, 'A finer country than Brazil, one blessed with a more genial climate, or possessing a more fruitful soil; one more happily diversified with wood and water, intersected with navigable rivers; or richer in mineral treasures, is scarcely to be found in the whole compass of the globe.'

132. The civil divisions of this country are as follow: Portuguese Guiana includes all the part north of the Amazons; and the remaining part is divided into the following provinces or capitanias:—

Para,	Rio Janeiro,
Maranham,	St Paul,
Seara,	St. Catherina,
Pernambuco,	Rio Grande,
Bahia,	Goias,
Minas Geraes,	Matto Grosso.

133. The population was recently estimated at 2,400,000; but in 1792 it consisted, according to Hassel, of 2,184,273, of whom one-sixth were whites of Portuguese origin, one-half mulattoes and negroes, and the remainder independent Indians. Four millions was the conjecture of Correa da Serra. They are now thought to be about three millions.

134. Of the chief towns Rio Janeiro or St. Sebastian stands in latitude 22° 54′ south, on the shore of a large bay or harbour, at the foot of several lofty mountains, and contains 140,000 inhabitants, of whom nearly one-half are negroes. The harbour is one of the finest in the world; the entrance by a mouth of two miles wide is bounded on one side by a conical hill, on the other by a mass of granite which supports the castle of Santa Cruz. The harbour widens to about three or four miles, and is sprinkled with islands, and indented with beautiful peninsulas. The tower stands on the west side of the town, on an eligible tongue of land, and is defended by a fort. Opposite this point is Serpent Island, the usual anchorage of shipping. St. Sebastian is the chief mart of Brazil, and more especially of the provinces of Goias, St. Paul, Matto Grosso, and Minas Geraes. St. Salvador or Bahia, seated on the eastern shore of the bay of All Saints, is in latitude 12° 45′ south. It extends three miles along the coast, and is in the centre more than one mile in the interior, narrowing progressively towards each extremity. Immediately behind the first street of the town the land suddenly rises to the height of 400 feet, and the principal part of the town is upon the top of this hill, whence opens a most magnificent prospect. So steep is the descent from the upper town to the lower, that packages are conveyed up and down by cranes and other machinery. The houses are mostly built of stone; besides which the town contains numerous churches and convents, many of them elegant, and a population of 100,000, of whom 30,000 are whites, 30,000 mulattoes, and the rest negroes. Pernambuco, containing a population of 32,000, lies on the coast, north-east of St. Salvador, in 8° south latitude, and consists of three divisions: viz. Recife, St. Antonio, and Boa Vista. Recife division is nearest the sea, on the extremity of a long narrow sand-bank, projecting from the main land, and is the principal mart for business. St. Antonio, the largest and handsomest division of the town, is seated on a sandy island, and is connected with the above by means of a bridge. Boa Vista, connected in the same manner with Recife, consists of small straggling houses, built upon the continent. Pernambuco is understood by some writers to comprehend the town of Recife, and the contiguous city of Ollinda, joined to it by a narrow sand-bank, in which case its population is 65,000. The harbour is formed by a reef of rocks; the tide flows under the bridges, and forms an expanse of water resembling a

lake on the north side of the town. Rio Grande, or St. Pedro, near the southern extremity of Brazil, in latitude 32° south, is a new flourishing town. The port is dangerous, the water being shoal, and a violent sea always running; notwithstanding which a great trade is carried on to all parts of Brazil. The population within the town, and a circle of twenty leagues round it, is estimated at 100,000. Villa Rica, containing 20,000 population, forms the capital of Minas Geraes, in the vicinity of the gold mines, 250 miles south of Rio Janeiro. Tejuco, the capital of the diamond district, is near the source of the Jigitonhonha, a branch of the Rio Grande, 200 miles north of Villa Rica. Cuiaba, on a river of the same name, ninety-six leagues from its confluence with the Paraguay, is the most western of the Brazilian mining districts. Para, the capital of the province of the same name, is seated on the river Tocantins, and contains 10,000 inhabitants. Maranham, or St. Luis de Maranham, has a convenient harbour, and contains 15,000 inhabitants. It is seated in longitude 43° 37′ west, on an island of the same name, at the mouths of three small rivers, which discharge themselves on the northern coast. Santos, the storehouse of the capitania of St. Paul, and containing 7000 population, is a place of considerable commerce, seated on the coast, west-south-west of Rio Janeiro. St. Paul, the chief town of the capitania of the same name, is in the vicinity of the gold mines, about forty miles from Santos.

135. The internal means of communication, not only with respect to the towns already stated, but through every part of this district, will be found under the article BRAZIL.

136. The commerce of Brazil, though formerly subjected by the Portuguese government to all the restraints of the colonial system, was, on the emigration of the court to Rio Janeiro, thrown open to Great Britain, on the condition of our merchants paying a duty of fifteen per cent. British manufactures are now imported together with oil, wine, brandy, linens, and cottons from Portugal. From the United States are imported flour, salted provisions, naval stores, and household furniture. The exports are gold and diamonds, wheat, horn, hair, and tallow; together with cotton, coffee, tobacco, sugar, and Brazil wood.

The following Comparative View of the Trade of the two chief Ports of this Kingdom we extract from the details of a celebrated author.

COMMERCE OF RIO DE JANEIRO AND BAHIA FOR THE YEAR 1816.

Portuguese Vessels from the Ports of	INWARDS.		OUTWARDS.	
	Rio de Janeiro.	Bahia.	Rio de Janeiro.	Bahia.
Brazil	1,062	290	862	214
Africa	43	21	56	37
Portugal and the Isles	78	75	57	56
River Plata	47	7	53	17
Southern Europe	3	18	1	16
Northern ———	3	6	2	3
Asia	7	0	12	0
Havannah and North America	0	1	2	0
Foreign Vessels.				
British	113	57	93	52
Russian	6	0	0	0
Swedish	8	1	12	1
French	12	7	11	4
Dutch	14	2	9	3
North American	46	17	41	22
Spanish	13	15	16	6
Prussian, Danish, German	5	2	5	0
Total	1,460	519	1,232	431

137. In 1820 the exports of British manufacture amounted to £1,860,000, and in 1821 to £2,230,000. The imports of 1820 were £950,000 and in 1821 amounted to £1,300,000. Three-fifths of the exports are sent to the capital. The returns are chiefly made in diamonds and precious stones, gold, coffee, tobacco, cotton, sugar, &c. The chief sources of the revenue are the customs inward and outward, the fifth on gold, duties on negroes, that on importation paid by the seller, that on further sale by the purchaser, and similar impositions, and amount to the annual sum of £2,500,000.

138. The community is divided into two classes, the Brazilians and the Portuguese, who mingle little in society. 'Marriages,' says a late author, 'at least such as I had an opportunity of witnessing, were attended by few. The bride first went into the confessional, and then approached the altar where the intended husband was waiting for her. Their right hands being then bound firmly together by a gold band, the prayers commenced; and at their termination the hands were loosed, and the ceremony was complete.' Marriages are formed when the parties are very young. Mothers are often seen not more than thirteen years old; indeed the youth of the women extends from ten to twenty-five years. Their funerals take place at night, when the body, being taken into the church, is exposed in full dress, and decorated with jewels; but after service is performed it is carried into the vault, stripped of its richest habits, some quick-lime is laid in the coffin, which is then locked, and the key given to the nearest relation. It is then put into a niche in the wall, and the frieuds retire.

139. Literature is at a low ebb. Since the late changes the press has been freed from many shackles; hundreds of political pamphlets have appeared, and a gazette is published twice a week. The Conde de Linhares, prime minister in 1810, caused the catechisms and vocabularies of the tongues of the indigenous tribes to be examined by the Jesuits; and a reprint to be made of their Lingua Geral. This tongue is understood by all the tribes, and considered to be the Tupinamba. The plan for writing an account of the medicinal plants in Brazil has been abandoned. The public museum has been enriched by various minerals; and the emperor has lately added a gallery of paintings, and proposed to establish an university in Brazil, but without success; it is, however, at last to be put in execution. In the absence of an university there formerly existed a large school, which has been since converted into a military hospital. The number of small schools is considerable; and Bell's system is adopted in one establishment with success.

140. The religion of Brazil is the Roman Catholic, and festivals are extremely numerous. The processions are splendid, and angels are personified by handsome young females dressed up with wings, and high-heeled shoes, and supported by fathers. There are two convents for women, of whom the number is very limited. Every person carries about with him the *Maos d'Azebiche*, a composition which is formed into small hands or some other charm. 'My mule-driver,' says a late traveller, 'had suspended about his neck a small piece of magnetic iron, which was to make him an object of attraction to all fair ladies and successful with them.' Witches are common; and so uncontrolled is the deleterious influence of superstition, that not many years ago a young woman, among the Indians of Marogogippe, was burnt alive on the suspicion of having set evil eyes on a sick person. By the treaty of 1810 toleration was granted to people of different persuasions, with the restriction that all meeting-houses were to be in external appearance like a private house. The conduct of the clergy is extremely reprehensible. 'One of them a Padre Canto,' says the traveller above alluded to, 'had four mulatto sons, who, following the mother, were slaves. He sold two of them; and the others performed the pleasing and filial act of carrying their father about the town in a sedan chair.

141. We subjoin an historical sketch of Brazil from the most approved authorities. Martin Behem is said to have first visited the coast in 1484; but the honour of having first seen this coast is more generally attributed to Pedro Alvarez Cabral, who in a voyage to the East Indies, with a Portuguese squadron, struck out to sea to avoid the storms of the Cape of Good Hope, and steering southward fell in with the South American continent, and anchored in Puerto Seguro Bay; landing with a body of troops, he took possession of the country in the name of his sovereign; which, in token of the cross which he erected, was called Santa Cruz, but afterwards changed by king Emanuel to Brazil from the red wood produced there. The Portuguese sent their convicts there, and received in return cargoes of parrots and dye-woods. In 1548 those of the Jews who had taken refuge in Portugal, were persecuted by the inquisition, and banished to Brazil, and commenced the cultivation of the sugar-cane. A colony was formed; and de Souza, a wise and able man, was the first governor; by building St. Salvador he formed a central rallying point for the colony, but found increasing difficulties in his enterprize till the Jesuits insinuating themselves among the savages, gained their affections by presents and by kindness, and brought them to look favourably towards the Portuguese. The prosperity of Brazil excited the envy of many of the states of Europe. The Dutch in 1624 detached a powerful squadron under their admiral Willekens, who landed on the coast of St. Salvador, and took possession of the town in the name of the United Provinces. He published a manifesto, allowing liberty of conscience to all who were willing to swear fidelity to the republic of Holland; and, having plundered the people of St. Salvador of their wealth, retired to Europe, leaving Colonel Van Dort as governor. The Spaniards next sent out a powerful fleet manned with 12,000 soldiers and marines under Frederic de Toledo, who compelled the Dutch to surrender. In 1630 the Dutch despatched Admiral Henery Louk with forty-six men-of-war to attempt the entire conquest of Brazil. This commander, after reducing Pernambuco, retired to Europe leaving behind him troops which re-

duced the provinces of Temeraca, Paraiba, and Rio Grande.

142. Maurice of Nassau was next entrusted with the enterprize of conquering Brazil, who reached his destination in the beginning of 1637, and after much opposition seized upon Seara, Seregippe, and the major part of Bahia. Seven of the fifteen provinces which composed the colony had already submitted to them, when they were checked by the revolution, which banished Philip IV. from the throne of Portugal, and gave to the Portuguese independence and a native sovereign. The seven unsubdued provinces of Brazil threw off the Spanish yoke, and the Dutch and Portuguese came to an agreement; the former relinquishing all claim to that part of Brazil which they had not conquered, and the latter confining the title of the former to the seven provinces of which they were in possession. This agreement gave rise to the name of the Brazils. The Dutch oppressing the Portuguese colonists, the latter took up arms and drove them from the provinces; and, by a treaty immediately succeeding, the Portuguese became the acknowledged masters of the whole kingdom, which was honoured by giving title to the presumptive heir of the crown. During the eighteenth century Brazil remained in the possession of the Portuguese. In the year 1806, the parent kingdom having been invaded by the French, the royal family embarked for Brazil under the convoy of a British squadron. From the moment of their arrival at Brazil a revolution took place in the character of the country; and Brazil rose to the dignity and importance of an independent nation. Commerce was thrown open to other nations, and a sudden spring was given to improvement. Amid the political changes which have passed upon this continent, the revolutionary ferment extended itself to Brazil. In 1817 an insurrection broke out at Pernambuco, but was soon overpowered. On the formation of a free constitution the king was compelled to return to Lisbon. This event occurred in July, 1821, when the heir apparent was left in the government as viceroy. Dissatisfied with the parent government, the Brazilian deputies assembled in Lisbon in the spring of 1822, but met with no success. Portugal had endeavoured to prevent any union amongst her transatlantic possessions. On the 12th of October, the anniversary of his royal highness's birth-day, the prince regent was proclaimed constitutional emperor of Brazil. Bahia however still groaned under the Portuguese yoke, but was shortly after added to the new government; and the independence of Brazil, has very recently been acknowledged by the Portuguese government.

143. The United Provinces, including that portion of territory formerly known by the name of La Plata, or Buenos Ayres, are situated between 12° and 40° 45′ south latitude, and 51° 10′ and 69° 55′ west longitude. They are bounded on the north by Peru and Brazil, east by Brazil, south by Patagonia and the Atlantic Ocean, and west by Chili, the Pacific Ocean, and Peru. Its length from north to south is about 1800 miles, and its mean breadth 800, including a superficial area of about 1,440,000 square miles, or 921,600,000 acres of land.

144. The chain of the Andes runs from north to south along the western boundary, and the country is generally mountainous. East of the rivers Paraguay and Parana is a fine and well-watered country; whilst the district lying between the above rivers and the mountains, and extending north and south throughout the whole direction of the country, consists of extensive plains. In the south these are called pampas, and are remarkably dry and destitute of trees; whilst many parts in the north are subject to inundation. One of these pampas commencing near the banks of the Parana extends into Patagonia and measured to its full extent is 1500 miles long and 500 broad. On this magnificent plain there is not a single hill, nor an object to vary the scene, but the eye passes over it as over the ocean in a calm.

145. The greatest natural disadvantage under which this province labours is the almost entire want of timber; the hard peach is chiefly cultivated for fuel. The soil is in many parts extremely fertile, producing the common fruits and vegetables of the temperate and torrid zones. The umbu is among the few indigenous trees of the country. Several species of the cactos, the cardon, or thistle, with blue flowers, and a few others, comprehend the larger portion of the native vegetable riches. Of the trees introduced by the Spaniards, except the hard peach and the olive, few have succeeded; the cherry-tree is common, but, the blossoms being destroyed by the winds, produces no fruit. The sauce, or willow, is sometimes met with; grapes thrive well; but the melon and apple are inferior. The paucity of vegetables in some parts has been attributed by some to the thickness of the clay bed; the vegetables of Europe have however been introduced with success. The territory east of the Paraguay and Parana is the finest part of the country, but has been chiefly appropriated to pasturage. The yerba, or Paraguay tea, flourishes here: it is a fine stomachic, and contains many excellent qualities; the genus is now made out; and it is believed that ultimately it will be cultivated in England with success.

146. Immense herds of cattle graze on these plains, and constitute one important source of the wealth of this kingdom. The bisachia (lepus biscaa), a small animal not unlike a rabbit, is found in great abundance. The armadillo is also common in the pampas; and a species of deer which has an unpleasant smell. The ounce is also abundant, but whether they cross the Parana is doubtful, there being so little shelter for them on the right bank. The birds are in this district more numerous than the quadrupeds. The swan of the Rio de la Plata is a most elegant bird, the body is perfectly white, the head and a portion of the neck black. To take them, a man enters the water with three large wooden balls, two of which are fastened at one end of a large thong of leather, and the third attached to the other extremity held in the hand; approaching the swan, he throws the balls with such dexterity, that they twist round the neck of the bird,

and as they are made of wood the bird cannot escape by diving. The South American ostrich (nandu) is met with in the pampas; it is about half the size of the African species, and the plumage in point of value far inferior. It is said that several females lay eggs of a yellowish colour in one nest, and that they are hatched by the male. There are two kinds of partridges in the pampas found in great abundance, the smaller is similar to the quail of Europe. Waterfowls are numerous on the banks of the rivers. A late traveller observes, 'there did not seem to me any great variety of insects:' the musquito is common, and fleas abound; they appear to live in the grass, as Dobrizhoffer says; for on lying down in some places the body becomes covered with them. Reptiles are not common. Bones of the megatherium have been discovered in the vicinity of Buenos Ayres: the Marquis of Loretto when viceroy, sent home in 1789 the first and perhaps the most perfect specimen of this enormous animal. It was discovered while making some excavations in the bank of the river Luzdu, fifteen leagues from Buenos Ayres, and is now in the cabinet of Madrid; a tooth of the same animal has within the last few years been found sixteen leagues farther in the same direction. Horses and mares are chiefly reared for their hides. The number of horned cattle and the cheapness of meat are objects of astonishment to all travellers. The whole ox may be bought for less than five dollars, and of these the hide is worth three dollars and a half.

147. The country is very rich in minerals, and a short time ago there were no fewer than seventy-three mines in actual operation, viz. thirty of gold, twenty-seven of silver, seven of copper, two of tin, and seven of lead. The richest of these are the celebrated mines of Potosi, discovered in 1545, and which from that period to 1803 yielded £237,358,334 sterling, or nearly £1,000,000 annually. The extensive plains lying between the Paraguay and the mountains, and watered by the Pilcomayo, the Vermejo, the Salado, and the Dulce abound with salt.

148. The Paraguay is the principal river of this country. It runs in the very centre of South America; and, after a course of more than 2000 miles, enters the ocean between Cape Santa Maria on the north, and Cape St. Antonio on the south. Its principal tributaries are the Parana and the Uruguay from the east; and the Pilcomayo, the Vermejo, the Salado, the Tercera, and the Saladillo from the west. From the junction of the Parana to the junction of the Uruguay, it is usually called Parana river; and from the junction of the Uruguay to the ocean, the Rio de la Plata is navigable for large vessels as far as Assumption a little above the mouth of the Pilcomayo, and nearly 1000 miles from the ocean; and for small craft to the eighteenth degree of south latitude. A little above this parallel it overflows its banks during the rainy season, and spreads over the flat country, forming an immense lake, called Lake Xarayes, about 330 miles long and 120 broad.

149. The Parana rises in the mountains of Brazil, in the province of Minas Geraes, and after a course of about 1000 miles joins the Paraguay at Corrientes. In latitude 24° is the fall of the Itu, formed by a collection of rocks rising from the bed of the river in separate masses, and leaving channels for the passage of the water. Boats pass down with difficulty, and are drawn up by ropes. The Uruguay rises on the declivity of the Brazilian Andes, in the province of Rio Grande near the parallel of 28° south latitude, and pursues a westerly course of more than 1000 miles. For 200 miles from its mouth it is navigable, but higher up the navigation is interrupted by rapids and falls. The Rio Negro is an eastern branch of this river, and joins it fifty-four miles from its mouth. The Pilcomayo rises in the Andes in the parallel of 20° north latitude, and flows east through a mountainous country 600 miles, and afterwards turning south-east traverses a level country for more than 400 miles and in 25° south latitude discharges itself into the Paraguay.

150. The Vermejo, rising near the source of the preceding river, flows south-east and joins the Paraguay in 27° south latitude. The Salado is difficult of navigation, and discharges itself at Santa Fé, in 31° 41′ south latitude, after a south-east course of 800 miles. The Saladillo, which after a course of several hundred miles joins the Plata, about fifty miles from Cape Antonio, may be considered as a continuation of the Rio Quinto. The Rio Dulce rises on the mountains of the interior, and flows parallel with the Salado, and loses itself about 100 miles north-west of Santa Fé in the salt-banks of Povonzos.

150. In the northern part of the country, the Mamore and other head streams of the Madera, rise on the north side of the Andes, of Chiquitos, and pass into Peru. Lake Titicaca opens a fine sheet of water 240 miles in circumference between two ridges of the Andes; it is so deep as to be navigated by the largest vessels, and contains several islands, one of which was the residence of Manco Capac, the first of the incas, and the founder of the Peruvian monarchy.

151. The climate of this country is various. The heat during summer is oppressive on the plains, whilst in the more elevated regions the air is cold and healthy. The north winds inevitably bring heat, and have the effect of the Sirocco on the feelings. The south-west winds, called pamperos from their blowing over the immense pampas in the south, are remarkably dry; and during their prevalence putrefaction scarcely goes on at all.

152. The civil divisions, as they existed in 1810, consisted of eleven provinces, one commandery, eight intendancies, and two audiences The intendancies are as follow:—

Intendancies.	Chief Towns.	Population.
Buenos Ayres	Buenos Ayres, Monte Video, Santa Fé, Corrientes	According to official estimates furnished in 1817, 1,300,000 Civilized Indians, 700,000 Savage Indians, Number unknown.
Paraguay	Assumption	
Cordova	Cordova, Mendoza, San Juan de Jacban, S. Luis de la Punta	
Salta	Salta, S. Miguel de Tucuman, Santiago del Estero, Jujuy	
Potosi	Potosi, Chayanta, Chicas	
Charcas	Chuquisaca, or La Plata, Yampares, Oruro	
La Paz	La Paz Sicasica	
Cochabamba	Cochabamba, Santa Cruz de la Sierra Mizque	

We give the following Table as including the Estimate of a recent Traveller, who considers the Population to be much overrated.

Summary of the Population of the Provinces of the Rio de la Plata.

Name of Province.	Population of City.	Population of Province.	Total.
Buenos Ayres	60,000	80,000	140,000
Santa Fé	25,000	35,000	60,000
Entre Rios	20,000	25,000	45,000
Cordova	14,000	30,009	44,000
Mendoza	20,000	30,000	50,000
St. Juan	—	—	20,000
Punta de St. Luis	—	—	20,000
St. Jago del Estero	—	—	30,000
Tucuman	—	—	28,000
Salta	—	—	20,000
			457,000

153. Many of the people of this territory perished in the revolution, and since that event they have greatly diminished, owing to the political changes which have occurred, and the large armies which have gone forth to assist other countries to throw off the Spanish yoke.

154. The following account of the chief towns is taken from an American author.—Buenos Ayres, the capital, seated on the south west bank of the Rio de la Plata, 180 miles from its mouth, where the river is thirty miles wide. Its population has been estimated at 62,000. Monte Video stands on the north shore of the Plata, 120 miles east of the preceding, and occupies the whole of a peninsula projecting southward from the main land. Its population has been variously stated from 10,000 to 20,000. Potosi, famous for its rich silver mines, lies in the Andes, in 20° 26′ south latitude. Its population is estimated at 100,000. Assumption stands on the east bank of the Paraguay, 977 miles from the sea, and a little above the mouth of the Pilcomayo. Its population is 7000. Corrientes, below the confluence of the Parana and the Paraguay, contains five thousand. Santa Fé, at the mouth of the Salado, has six thousand. Cordova, seated on the river Primero, which loses itself in one of the salt lakes, has also six thousand. Santiago del Estero lies north of the preceding, on the west bank of the Dulce. Mendoza, at the foot of the eastern declivity of the Andes, contains twenty-one thousand. St. Juan, north of the above, contains nineteen thousand. Rioja lies farther to the north. Tucuman lies on the Dulce, upwards of 100 miles above Santiago del Estero. Salta, on a branch of the Vermejo, contains 9000 inhabitants; La Plata, or Chiquisica, sixty miles east of Potosi, fourteen thousand; Charcas or Chayanta, north of Potosi, thirty thousand; and La Paz, near the south-east extremity of Titicaca Lake twenty thousand.

155. The manufactures of this part of South America are few and unimportant. The commerce under the old government was a monopoly in the hands of the Spanish merchants. At present the export and import trade is chiefly in the hands of the British. The exports are hides, beef, tallow, furs, peltry, and mules; together with gold and silver from the mines of Potosi. The imports are principally British manufactures, with some articles from the United States, &c. Exports and Imports have been estimated by an American author at 10,000,000 dollars per annum. The following tables may tend to elucidate this branch of the geography of these provinces, and the importance of the trade to the British territories.

Goods shipped from England to Buenos Ayres.	Year.	Vessels.	Value.
——	1816—1817	—	338,487
——	1822	167	——
——	1823	—	1,164,745

156. In the year 1821 three hundred and twenty-two vessels were cleared outwards at Buenos Ayres, of which 114 were British; and in 1822 three hundred and four vessels, of which 167 were British. During this year no fewer than 957,600 horse and cow-hides arrived in England, and as great a number sent to Antwerp and other continental ports. The Yerba or Paraguay tea has formed the most lucrative branch of inland commerce. In 1814 no fewer than 20,000 bales came down the river, of seven, eight, and nine arobas, or 210,240,270 pounds, and worth, on a moderate computation, 1,000,000 pounds sterling.

157. The state of the fine arts in the United Provinces is not high, but music is successfully cultivated. The Spanish spoken there is provincial, or any thing but pure Castilian. Formerly the only university in this part of the world was at Cordova; and, before the declaration of independence, every obstacle was thrown in the way of public instruction. Common schools only were permitted, and these under municipal regulations. At present Bell's system is taught in many large schools at the expense of the government; and, on the 9th of August, 1821, a decree came out for the formation of an university in Buenos Ayres. Books are permitted to enter free of duty, and some native works have been published. A large public library, consisting of 12,000 volumes, was established some years ago, and this is now greatly augmented. Rivadavia, the secretary of state, in January, 1823, established a library society, and ordered a collection of the national poetry to be made, and printed at the public expense. There is no scientific journal printed, but there are several gazettes.

158. The religion is the Roman catholic, but other sects are tolerated. A late traveller speaks favourably of the morals of the people, but attributes to them a disposition to indolence. Fighting with swords, knives, and other weapons, is frequent; and numberless are the crosses about the doors of the pulperias, intimating the fatal quarrels which they have witnessed.

159. The country was formerly a Spanish colony under the government of a viceroy: but a new government was established in 1810, which ruled in the name of the Spanish king till 1816; and on the 9th of July declared itself independent under the title of the United Provinces of Rio de la Plata, which has been since changed for that of the United Provinces of South America. Three or four revolutions have occurred since 1810; but during all the changes there has existed a congress consisting of representatives from the several provinces. The revenue for the year 1817 was 3,037,187 dollars. Since the separation of the provinces in 1820, the style of the chief became necessarily altered. General Rodriguez was, on the 6th of October, 1820, appointed governor and captain-general of the province of Buenos Ayres for three years; in which office he was succeeded on the 1st of April, 1824, by D. Juan Gregorio de las Heras, who was chosen by a majority of ten voices. In August, 1821, the chamber of representatives was declared extraordinary and constituent, and regulations made accordingly. The improved state of the country is owing to the appointment of D. Bernadino Rivadavia to the office of secretary of state; he had been some time in England, and observed our enlightened institutions. Under the Spaniards the king was head of the church; the tithes fell into the royal treasury, and monks and nuns were numerous. The government is now the head of the church, and Rivadavia used every effort to clip the wings of the cloistered clergy; to prevent any further importation of them, and to raise the secular clergy in the eyes of the people, tithes were abolished and the dignitaries of the church limited to a dean with a salary of 2000 dollars, and four presbyters with 1600 dollars. An attempt was made to overturn the government, and with the cries Viva la religion, Mueren los Hereges! a number of rebels galloped into the capital, but this was soon suppressed. Rivadavia also remodelled in a measure the courts of justice, raised the salaries of the judges, and caused them to furnish a monthly list of all cases brought before them, civil or criminal. The establishment consists of four counsellors of justice at a salary of 2500 dollars, and five judges of the high court at 2000 dollars. Juries have not yet been introduced. The crimes punished with death are treason, murder, and robbery; and of late the military have been rendered amenable to the civil law.

160. The discovery of this country took place later than that of the other part of South America in the Atlantic. Juan Diaz de Solis, a Spaniard, is said to have explored it in 1515, and to have taken formal possession of it. In 1526 Sebastian Cabot, then in the Spanish service, entered Rio de la Plata, and discovered an island which he called St. Gabriel: twelve leagues further in the interior he discovered the river St. Salvador, and still further another, which he called the Paraguay. From the supplies of silver which he received from the Indians, he called the main river Rio de la Plata, or the river of silver. In 1535 Don Pedro de Mendoza, sent out by the Spanish government, founded the city of Buenos Ayres. The government however, until the establishment of a vice-royalty, was dependent upon that of Peru, although the chief of Buenos Ayres had the title of captain-general. The restrictions of commerce produced much infelicity and poverty. Reiterated remonstrance at length relaxed the policy of the Spaniards; monopoly was to a certain extent abandoned; the annual flota was lessened from 15,000 to 2000 tons of shipping, and in 1748 sailed to Cadiz for the last time. In 1774 a free trade was allowed between several of the American ports; and in 1778 several Spanish ports were allowed an open trade with Buenos Ayres, and

the ports of the Pacific. The country was now erected into a vice-royalty, and its trade continued to augment until the war between Spain and England occasioned a material interruption. In 1806 the capital was taken by a British army under General Beresford; but after a few weeks a body of militia under the command of General Liniers, a French officer, invested the city, and, on the 12th of August compelled them to surrender. Shortly afterwards, a body of 5000 troops, under the command of Sir Home Popham, arrived from the Cape of Good Hope, who, after taking Fort Maldonado at the mouth of La Plata, laid siege to Monte Video, but were repulsed; but other troops arriving under Sir Samuel Auchmuty, the town was carried by storm. In May, 1807, when fresh succours arrived, General Whitelock assumed the chief command; and being joined by General Crawford, proceeded with 12000 men, and were permitted to approach this town without molestation; but no sooner had they entered than they found that every house was converted into a fortress, and were received with a tremendous and well-directed fire of grape and musketry: General Whitelock was at last obliged to surrender to the militia of Buenos Ayres.

161. The important services of Liniers raised him to distinction; and the people disgusted with the conduct of Sobremonte the viceroy, who fled into the interior provinces, immediately raised him to that dignity. The situation of the parent country was critical in the extreme: the French overran the country; the United Provinces were sending money and supplies, and at length Buonaparte, whose power over the parent-country appeared to be unlimited, turned his attention to the colonies. Liniers used every means to bring them to his interest; but Don Josef de Goyeneche, deputed from the junta of Cadiz, by his well-concerted measures prevented a counter-revolution of the public opinion; and caused the inhabitants of Buenos Ayres to proclaim Ferdinand VII. On the 1st of August, 1809, the people rose at the instigation of the Spanish deputy, and demanded the establishment of a junta, but were suppressed by the troops of Liniers. In August, 1809, Cisneros, a new viceroy, was sent out from Spain; and Liniers was deposed by the junta and exiled to Cordova. Commotion succeeded commotion; and at length, on the 26th of May, 1810, the people resolved upon taking the government into their own hands; and, appointing a provisional junta of nine persons, deposed the viceroy, and sent him to Spain. From this event must be dated the independence of the state. Monte Video and the provinces of Cordova and Paraguay protested against this measure, but were carried along with the stream. Liniers forming an army in Cordova was joined by General Nieto with an additional one collected in Potosi, and made an effort to stem the torrent; but meeting with a total defeat was, with his coadjutor, and six of his principal officers, beheaded.

162. Early in 1813 Potosi district fell into the hands of the patriots, who instantly coined money, raised a national flag, and performed other acts proper for an independent state. At the restoration of Ferdinand in 1814, a deputy left Rio de la Plata to submit the state of the country at Madrid, including the wants of the people, and to solicit a general amnesty for the past, and a new system for the future; but these representatives being rejected with contempt, Spain lost the favourable opportunity for regaining her territories in the new world. In 1814 General Artigas, who had considerable influence and command in the country east of the Uruguay, disturbed the friendship which had hitherto subsisted between the two provinces, and strangely retired from the siege of Monte Video, the last strong hold of the Spaniards, which nevertheless fell into the hands of the patriots. The succeeding two years were filled up with deplorable scenes of anarchy and confusion.

163. In 1816 a sovereign congress met at Tucuman; and D. Juan Martin Pueyrredon was appointed dictator of the United Provinces of the Rio de la Plata, and on the 6th of October took place the solemn act of independence. During these successes the Portuguese marched an army into the Banda Oriental, and took possession of the most valuable part of the country. An understanding and even a combination might have been effected but for the jealousy of Artigas, on whom had devolved the care of Monte Video. This town was taken by the Portuguese under the command of General Lecor, since called Baron de Leguna. The provinces on the east bank of La Plata were desirous of an union with Buenos Ayres; but the influence and disaffection of Artigas prevented it, and the anarchy of the chiefs of Banda Oriental afforded the invaders a favourable opportunity to complete their conquest. D. José de San Martin now emerged upon the public notice; he was governor of Mendoza; and while there meditated the plan of proceeding across the Andes to reconquer Chili. In thirteen days he crossed the great chain with the loss of 5000 horses and mules, and a few blacks, and conquered at Chacabuo. In 1811 the director sent forces into the Entre Rios to support the independents, but they were twice defeated. General San Martin shortly after sealed with the blood of the Spaniards the independence of the provinces of the Rio de la Plata. The animosities of the provinces in contact with Buenos Ayres still continued; Artigas being hard pressed by the Portuguese escaped across the river to Paraguay, where he was taken charge of by the dictator Francia. In 1819 this heterogeneous union of the provinces was terminated by the flight of Pueyredon the dictator to Monte Video.

164. In March, 1820, Ramirez, chief of the Entre Rios, with Lopez, governor of Santa Fé, marched against Buenos Ayres, and the political changes that followed were numerous; but on the 6th of October D. Martin Rodriguez was finally confirmed governor. At present all the principal places on the eastern shore of the Uruguay, and of the country between that river and the Parana, with the province, still remain in possession of the Portuguese. Passing over the several animosities of the different provinces, the most important events in the recent history of this republic are the annexation of the Banda

Oriental to the kingdom of Brazil, and the recognition of the independence of Buenos Ayres by the Portuguese government in 1821. A general congress was appointed to meet at Cordova; and a decree of the 15th of December, 1821, announced that the number of deputies from each province would be regulated by its relative population.

165. Peru, situated between 3° 25′ and 21° 30′ S. lat. and 65° and 81° 10′ W. longitude, is bounded on the north by the republic of Columbia; east by Brazil; south by Atacama Desert, which separates it from Chili, and by the United Provinces; and west by the Pacific Ocean. It is about 750 long, and 660 broad, including an area of 495,000 miles.

166. The Andes pass through this country parallel with the coast, in the direction of south-east and north-west. Soon after crossing the southern boundary, they divide into three ridges or cordilleras, which, in the sixth degree of south latitude, again unite in a single chain. Along the coast is a narrow plain from thirty-five to seventy miles wide, called the Country of Valles, which consists of a succession of sandy deserts. East of this is the lower ridge of the Andes, composed of successive summits of immense height, reaching the whole length of Peru. Between the western and central ridges is a series of plains varying in width from 100 to 170 miles. These are intersected by deep valleys; and are elevated generally 8,000 or 10,000 feet above the level of the ocean. The summits of the central Cordilleras are less broken than the western, and reach the average altitude of 15,000 feet. Immense and unexplored plains stretch beyond the eastern Cordilleras, which reach into Brazil, and are traversed by the numerous tributaries of the Amazons. The mountains that rise comparatively little above the level of the table-land are chiefly metallic; and some of them are said to be more abundant in silver ore than any others on the globe. The mines of Gualgayoc in the partido of Choto, are 13,385 feet above the level of the sea; in the plains of Curimayo, gold was procured by the Incas at 11,184 feet; petrified shells are found on the plains of Chocopampa at 13,123 feet. The mines of Pasco are 13,000 feet; the ancient Peruvian road 15,540 feet; and the town of Micupampa 11,670 feet above the level of the sea.

167. The numerous mines of this kingdom in 1791 are exhibited in the following table:

Mines.		Produce.
Gold mines and workings	69	4,500,000
Silver mines	784	
Quicksilver	4	
Lead	12	
Copper	4	

168. The rivers on the eastern side of the Andes are not of considerable importance. On the northern side rises the Amazons and its tributaries, for which see Amazons. The soil of Valles is sandy and comparatively barren, containing, however, a few fruitful spots on the banks of small rivers. The elevated plains are verdant, and produce a great diversity of fruits and vegetables.

169. The vegetable productions are numerous and diversified; while sugar, rice, tobacco, yams, sweet potatoes, and cocoa, are raised in warm situations, grapes and quinoa (chenipodium) are found in colder spots, and potatoes in those which are most elevated. The papa amarilla, a yellow potatoe, is produced thirty leagues north-east of Lima; the arracacha, which is both yellow and white, and similar in taste to a boiled chestnut, is common in New Granada; the camotes, or sweet potatoes, are valued in Chili. The grapes are well-flavoured, as also the melon and water-melon, the granadilla; the palta (laurus persea) are common; the chirimoya is of a most exquisite taste. The name is derived from chiri, cold, and muhu, seed, or cold-seeded. The tree is twelve or fifteen feet high, with large broad leaves, and branches extending to the ground, producing a small, pink, and sweet-scented flower, and a fruit varying in size from an orange to a large melon, covered with a smooth green skin, and a white interior pulp, if not liquid easily cut with a spoon and enveloping a number of black shining pips of the size of an almond kernel, which on exposure to the air become of a light brown. The flavour of this production is not easily described; but it resembles the custard-apple, and contains that happy mixture of sweetness and acidity, with delightful scent, which forms the perfection of fruits.

170. Musquitoes are not remarkably troublesome in Peru; but fleas of unusual size and activity are common, and swarm like flies upon the sea beech. Other entomological productions are numerous.

171. The climate of Lima and the neighbouring coast is remarkable. This spot, situated within twelve degrees of the equator, consists of a sandy poor soil, on which it has not rained for fourteen years; and which nevertheless produces some of the finest and heaviest crops to be met with in any part of the globe. The barometer is little affected by atmospheric changes; and Dr. Unanue gives its mean height at 27.4; but in this little confidence can be placed. The thermometer varies from 61° to 84°.

172. In this part of the Pacific the wind is usually from the south, but occasionally blows with extreme violence from the north. At day-break there is a gentle breeze from the west, which towards eleven o'clock turns round to the southward, and at sun-set reaches the south-east. Fogs prevail in the winter from April to November, and during the rest of the year take place at the changes of the moon. In some parts of the year the sun is obscured for days together; towards the end of autumn the sun is perfectly bright, and on some days in the winter is entirely concealed, the rest of the year being one perpetual change from light to dark. The valley of Rimac is rendered fruitful by fogs; but in the neighbouring Sierra the rain falls with great violence, accompanied by much thunder. This last phenomenon is so rare in the valley, that the dates of thunder-storms are preserved, and only

four have occurred since 1582. As the Chilian Cordillera thunder-storms are frequent, while the plains below are free from them, so in the autumn on the Andes the snow-storms are seldom unaccompanied with lightning.

173. The heat is intense in the summer, and in the low country, fevers, pleurisies, and constipations are common. The Andes in some places intercept the clouds and receive their contents; and in the high table-land the climate is a mixture of spring and autumn, summer and winter being unknown, and vegetation flourishes at the height of 10,000 feet. In the plains, between the western and central Cordillera, the rains prevail from November to May. The highest Andes experience uninterrupted winter between the tropics. Earthquakes in this country are supposed to occur once in the course of fifty years, and the epochs of 1586, 1630, 1687, 1746, and 1806 seem to favour this notion. The shocks of late years have not been so violent as formerly. Every earthquake in South America is succeeded by rain, and after the violent shock in 1806 the streets of Lima were almost inundated for several days. A further description of this, as also the other kingdoms of South America, when we come to treat of those separate articles.

174. Peru is divided into seven intendancies, which are subdivided into fifty-one districts. These with their population, as they existed in 1795, are exhibited in the following table :—

Intendancies.	Whites.	Indians.	Mestizoes.	Mulattoes.	Slaves.	Total.
Lima	23,270	63,180	13,747	17,864	29,763	146,824
Cuzco	31,828	159,105	23,104	993	283	225,313
Arequipa	39,357	66,609	17,797	7,003	5,258	136,024
Truxillo	19,098	115,647	76,949	13,757	4,725	230,176
Guamanga	5,378	75,284	29,621	943	30	111,258
Guancavelica	2,341	23,899	4,537	—	41	30,818
Tarma	15,039	105,187	78,682	844	236	199,988
Total	136,311	608,911	244,437	41,404	40,336	1,071,399

Besides these many tribes of Indians, whose population is unknown, occupy all the plains to the east of the mountains. 'The whole population of Peru,' says a recent author, 'including the Indians, amounts to 1,400,000 souls.

175. There are several important towns in Peru, of which we must take some notice, although a complete description of them in this place will not be expected. Lima, situated about two leagues from the coast in lat. 12° 5′ south, is in the centre of a delightful valley, watered by the small river Rimac, which flows along the northern side of the city, the houses are generally low, on account of the frequent earthquakes, and are constructed chiefly of wood. The plaza, a great square five hundred feet above the Pacific, is of great extent and beauty. In the centre is a large and magnificent fountain; and on its sides are disposed the cathedral and archbishop's palace, and that of the viceroy, together with the town-house and prison. The other principal buildings are the churches and chapels; which are partly built of stone, ornamented with numerous paintings, and decorated with gold, silver, and precious diamonds. The population in 1790 amounted to 52,627, in the proportion of 17,215 whites, 8960 negroes, 3912 Indians, and an unknown number of Mulattoes, Mestizoes, &c. Of the whites 3000 are said to have been monks and nuns. The present population, according to a late traveller, is about 70,000 souls, of whom about 25,000 are Spaniards, 2500 monks, nuns, and secular clergy, 15,000 free Mulattoes, 15,000 slaves, 7200 Mestizoes and 5000 Indians. Luxury in dress, and passionate fondness for show and splendour, distinguish the inhabitants of Lima. Calao, the port of Lima, is two leagues distant, in a low flat point of land, near the mouth of a river of that name. The port, one of the most commodious on the coast of the Pacific Ocean is defended by numerous batteries. 'It is the rendezvous of about 17,000 tons of shipping,' says an American author; 'and contains a population of 5000.' Cuzco, the ancient capital of the Peruvians, is 550 miles east-south-east of Lima, and still contains many monuments of its antiquity, of which one of the most remarkable is the great fortress built for its defence. The population, as stated by the author above alluded to, is 32,000; in the proportion of 16,000 whites, 14,000 Indians, and the remaining portion a mixed race. Arequipa 217 leagues south-east of Lima, on the banks of a small river about twenty leagues from the coast, is one of the largest towns in Peru, described by an American publication as containing 24,000 inhabitants. Truxillo, in lat. 8° south, contains 6000. Guamanga, an Indian town sixty-three leagues south-east of Lima, contains 25,970 souls, of whom only 169 are whites. Tarma, eighty-five miles east of Lima, contains 5538 souls, of whom 361 are whites. Guancavelica, celebrated for its quicksilver mine, and for the quantity of precious metals found in its vicinity, is 140 miles south-east of Lima; and contains 5156 inhabitants, of whom 560 are whites.

176. There are several manufactures in Peru much in request. Among the first are articles of silver filagree of exquisite workmanship, which are chiefly made in Guamanga, consisting of animals and devices for burning pastilles, holding fruit, &c. Another fabric highly esteemed is that of a species of grass, bleached and plaited into various articles, as pouches and cigar cases. Hats of this material are exporte and found convenient in warm climates. The

traveller from whose work these observations are derived could obtain little information respecting this exquisitely fine material in its raw state, and was equally unfortunate respecting the tinder which is carried in silver tubes in the pockets of all classes for lighting cigars; he learnt, however, that it is the inner bark of a tree which grows near Quito.

177. The trade of Peru is considerable as well with Europe as the Philippine islands and other parts of America. The exports are chiefly gold, silver, wine, brandy, Peruvian bark, salt, Vicuna wool, coarse woollen, sugar and pimento. Its imports are from Europe, manufactured goods, as silks, cloths, lace, &c.; from the Philippine islands, muslins, tea, and other East India goods; from Guatimala, indigo; from Chili, wheat and copper; from Buenos Ayres, Paraguay tea, mules, &c. The inland communication is indifferent owing to the deep valleys which separate the elevated plains and the lofty mountains which rise between the table-land and the coast.

178. The religion of Peru is the Roman Catholic, and the church is under the direction of one archbishop and four bishops.

179. While subject to the dominion of Spain the government was vested in a viceroy, and had two royal audiences, viz. Lima and Cuzco: the Creoles were, however, excluded from all important offices, civil, military, and ecclesiastical; which were conferred upon the European Spaniards. Its present government will appear in the following sketch of its history.

180. The traditions of the Peruvian Indians represent that their ancestors were taught the arts of society and government by Manco Capac and Mama Oello, a man and woman who came from an island in a lake south of Peru; the former instructing the men in agriculture and other useful employments, and the latter applying her assiduity to teach the females weaving and spinning. A town was founded (the subsequent capital of Peru), laws were framed, and the illustrious stranger constituted himself their sovereign and priest, and established the succession hereditary in his family. The territories were greatly enlarged; and tradition represents the disappearance of this personage to have been as mysterious as his former appearance. This happened about the beginning of the thirteenth century of the Christian era; and, from this period to the epoch of the Spaniards' arrival there, fourteen successive incas, or monarchs, are said to have reigned.

181. In the reign of Huana Capac, in 1524, Peru was discovered by Europeans; shortly after which the Spaniards insinuated themselves into the newly-discovered territory, and, in a manner which will be described under the article Peru, acquired possession Pizarro, who had been sent from the king of Spain with the title of governor of Peru, on a pretended provocation attacked the natives, and gained possession of the inca's person, who offered for his ransom as much gold as would fill the place in which he was confined. This was accepted; and the unfortunate monarch put to death immediately afterwards; being condemned to be burnt, after a mock trial upon the pretended charge of having wrested the sceptre from his brother, the rightful sovereign. The same individual defeated Paula Inca, a brother of the deceased, extended his possessions, and sent an immense present of gold and silver to the king of Spain. He was confirmed in his government, to which an addition, seventy leagues south, was made; and was created Marquis of Atibillos; while Almagro, with a priest named Hernando de Luque, who accompanied him in the original voyage of discovery, received the government of the country 200 leagues south of that prescribed to Pizarro.

182. In January, 1533, Pizarro founded the city of Lima, and distributed the lands among his colonists; but Manco Capac, the reigning inca, took up arms; the Peruvians took Cuzco, and even Lima was with difficulty retained. Almagro considering Cuzco within the limits of his grant, marched against it in 1537; and the inca retired to the mountains, whilst the brothers of Pizarro submitted. Pizarro shortly after marched in person, and in a decisive action fought near Cuzco, took Almagro prisoner; shortly after which he brought him to trial, and beheaded him. Pizarro himself was assassinated two years afterwards, on the 26th of June, 1541, by one of the party of Almagro. Vasco de Castro was then appointed governor, and was succeeded by Blasco Vela, whose conduct excited an insurrection, at the head of which was Gonzalo Pizarro; and the royal troops were defeated in a pitched battle, in which the viceroy was slain. Pedro de la Gasca, a priest, being sent out as president, defeated Pizarro; who, after undergoing a trial, was beheaded on the 10th of April 1548. In 1562 Toledo, the viceroy, attacked Tupac Amaru, son of Manco Capac, who had taken refuge in the mountains; and the inca surrendered himself, with his wife and children, who were all carried prisoners to Cuzco. The inca was sentenced to be beheaded, which sentence was executed; and thus expired the last of the Peruvian emperors. The sons of Indian women by Spaniards were put into confinement, and many of them to the torture, on a charge of conspiracy. The royal authority thus became established in Peru.

183. The year 1782 was marked by an insurrection of the Indians, under Jose Gabriel Condorcanqui, a descendant of Tupac Amaru. He had petitioned the Spanish court to restore to him the title of Marquis of Oropesa, as granted to his ancestor, Sayu Tupac; but finding his request neglected, he proclaimed himself inca, and the Indians flocked to his standard: he proclaimed vengeance against the European Spaniards; but, after two years varied success, he and his family were made captive, and, with the exception of his brother Diego, who escaped, all executed. Diego himself, on suspicion of his being concerned in a revolt which happened at Quito some years afterwards, was beheaded. Of the history of Peru little more is known till the invasion of Spain by Napoleon.

184. In the early part of that contest the vice-royalty was less agitated by revolutionary movements than any other part of the continent, owing to the strong political holds in which the

influence of the Spanish government was entrenched in that quarter. In 1809, when juntas were established in the cities of La Paz and Quito, Peru sent out troops, which for the time suppressed their rising efforts. In 1813 a strong force sent against the republicans of Chili restored the royal authority. In 1817 the tide of fortune was turned, and the victories of General San Martin compelled the Peruvian army to evacuate Chili; and Chili, in return, having acquired sufficient strength, sent an army into Peru, and compelled the surrender of the capital. Lima capitulated to the liberating army on the 9th of July 1821. A few days afterwards San Martin entered and held his levees in the vice-regal palace. Callao was next blockaded by sea and land; and, on the 28th of July, the solemn declaration of the independence of Peru took place with considerable pomp; and in commemoration medals were struck. San Martin took upon himself the sovereign authority under the title of protector. On the 20th of September, 1822, he called together a constituent and sovereign congress; and placing in their hands the supreme government of affairs, retired as an individual to Chili.

185. From that time affairs wore a chequered appearance. The congress appointed a governing junta unfit for their calling; the patriots on the side of Arequia were defeated in the commencement of 1823. Rivaaguero shortly afterwards dissolved the congress, and anarchy prevailed; and, in June, General Cantarac marched down and took Lima, and remained there fifteen days. Bolivar arrived from Guayaquil with 4000 troops, reinforced by Chilians, who landed about the same period. The Spanish troops still maintained their positions in the Sierra. Happily there is no prospect of the re-establishment of the Spanish power in Peru; but the state of the country is far from happy; agriculture is destroyed, the mines are neglected, the country is without capital, and the chiefs without talents to govern.

186. Chili is a long narrow country, lying between the Andes and the Pacific Ocean, between 24° 20′ and 43° 50′ S. lat. and 68° 50′ and 74° 20′ W. long. It is bounded on the north by the desert of Atamaca; east by the Andes; south, Patagonia and the gulf of Guaiteca; and on the west by the Pacific Ocean. It is about 1350 miles long and 130 broad, and includes an area of 175,500 square miles.

187. The face of the country is picturesque and delightful. The lofty chain of the Andes runs along its eastern boundary; while the country below is composed, in a great measure, of valleys surrounded by subordinate elevations, through the openings of which the inhabitants of one valley hold intercourse with another To the traveller who wanders over this delightful country, the scenery is often grand and magnificent; especially when, in addition to the natural features of the country, he obtains a view of the Great Pacific Ocean.

188. The soil of Chili is a stiff clay, abounding with water-worn pebbles, but of singular fertility. Numerous streams and mountain torrents descend from the Andes, watering and refreshing the country, but there are no streams of any considerable importance. The most remarkable are the Salado, a northern boundary, Huasco, Juncal, Limari, Coquimbo, Maypo Quillota, Mataquito, the Maule, Itata, Tolten, Biobio, Callacallas or Valdivia, and Bueno. Numerous harbours are seen upon the coast; and several lakes are found in the interior of considerable extent. Of these, that of Aculeo, from its proximity to the capital, is most visited by foreigners. The baths of Colina are much celebrated. Eleven leagues north of the capital the water issues out of five small holes from a chlorite slate, at a temperature of eighty-five degrees. The scenery is grand and magnificent. There are forty-seven islands in the Archipelago of Chiloe or El Ancud, at the southern extremity of Chili, of which thirty-two are peopled by Spaniards and Indians, and the rest uninhabited: Chiloe is the largest and gives its name to the whole group. Those of Juan Fernandez are two small uninhabited islands, in lat. 33° 40′ S. and long. 70° W. about 400 miles from the coast of Chili.

189. The whole of the Chilian territories are fruitful, the southern part abounding with corn, wine, and oil. The country between the parallel of thirty-two degrees and the northern boundary is barren of vegetation, but rich in mines of the most precious metals. Wheat is extensively cultivated in the valleys; barley and hemp flourish in most parts of the kingdom. Vines and olives are numerous; in short all the delicacies and luxuries of life which spring out of the earth, are capable of great perfection in Chili. From a large palm a kind of honey is produced, dark-coloured, and resembling molasses and water, by boring to the heart of the tree called *miel de palma*. The bark which produces soap by mastication (the *quillai*), and a plant resembling English groundsel, which when rubbed on the cheek yields a scarlet dye of a lasting nature, are indigenous. Botany is on a very extensive scale; the cold summits and warm valleys of the Andes offer plants of different habits which might be transplanted to any clime. The calceolarias, the varieties of the myrtle, the profusion of medicinal plants and dye-woods, and the large spreading trees of the south, open a fine field to the eye of a philosopher.

190. The climate of Chili is the most delightful of any in the New World. The temperature is moderate, the heat of the summer being finely tempered by its vicinity to the Andes, and the refreshing breezes of the Pacific Ocean. The summer commences in the month of December, and a shower seldom falls during its continuance, the heavy dews supplying the deficiency of rain. Chili, as to its climate, has been distinguished into two regions, viz. the variable and humid region, south of the Maule, where the weather is changeable and rains frequent; and the invariable or dry country, to the north of that river, where it does not rain for two-thirds of the year. In the most northerly provinces of the latter region it does not rain at all. Throughout the whole of the dry country, extending north from thirty-five degrees of south latitude, a distance of nearly 700 miles, not a cloud is to be

seen from November to May, the atmosphere is perfectly clear, the dews are scarcely perceptible, and the heat little oppressive. The thermometer fluctuates between seventy and eighty degrees of Fahrenheit, and nearly rises to eighty-five degrees. 'In the shade,' says a late traveller, 'it seldom, during my residence, exceeded seventy-six degrees, this was in the season that would correspond with an European autumn. The thermometer in the winter seldom falls to freezing, but early in the morning there is a cold feel which continues about half the day. Snow has not fallen in the memory of man. The south-east winds are peculiarly drying and generally cause the cuticle to peel off. North-west gales from the North Pacific Ocean are common in the winter time; they bring abundance of rain, and frequently damage the shipping off the coast. Storms are rare; but lightning, if ever seen, is very seldom. This phenomenon, the clearness of the atmosphere, the beauty of the celestial luminaries, the magnificence of the nights, and the general illumination of the heavens have opened sources of astonishment to those who have studied astronomical subjects. This, however, is to be explained from well-known natural causes.

191. 'There are fourteen volcanoes in Chili,' says an American author, 'which are in a state of constant eruption; and several others which discharge smoke at intervals. With one or two exceptions, they all lie in the centre of the Andes, from east to west.' Earthquakes are frequent, but they are light and little notice is taken of them. Only five great earthquakes occurred between the years 1520 and 1782.

192. Chili abounds with almost all the precious and useful metals; gold is found in the sands of the plains, brooks, and rivers, and in almost every mountain or hill. Several of the mines have been wrought for centuries; yet, perhaps, the greatest proportion of the gold found in Chili is procured by means of washing the beds of rivers. It is of a very pure quality; 'but,' says a late traveller, 'I met with it in no instance crystallized, but in large flattened grains of a peculiarly bright colour.' From this circumstance, he concluded that its matrix had been originally some metallic substance, probably the sulphurate of iron; and beds of gold of several inches thick are frequently met with which have never been disturbed, as appears from the sharp angles which could only have been left by some decomposed substance. This traveller observes with respect to the gold mine on the road to Valparaiso, that it existed in a gangue of iron pyrites, but was neither rich nor extensively worked. The auriferous iron pyrites of Chili he found isolated and finely crystallized; and at Coquimbo gold in a matrix of carbonate of copper.

193. The silver mines are confined to the highest and coldest parts of the Andes. The silver mine of Huasco, discovered in 1811, is said to be the richest in the world, as the ore yields, by one-half, more pure silver than the same quantity of the ore of Guanacuato, which is the richest in Mexico; and three times as much as that of Potosi. Some of the silver ores consist of pure sulphurate of silver, containing eighty per cent. of metal. They are in many cases worked in veins, running through a clay-slate, and those near the Pacific through a mountain of limestone. Some specimens from Huasco have been pronounced to consist of native silver, with the muriate and carbonate of lime. The tax paid to government on the precious metals is about eight per cent.; on copper five per cent.

194. The copper mines are numerous, and yield upwards of half the weight of the ore in refined copper; that of Coquimbo is esteemed the best in the world. In 1787 there were more than 1000 mines between the cities of Copiapo and Coquimbo. Mines of quicksilver are found in Chili; also lead and iron mines of the very best quality. A few years ago it was calculated that the amount of gold and silver produced annually was 3,000,000 dollars, and that of copper and tin 500,000. Coal seams have been found near Talcaguano, the port of Conception, on and near the surface of the earth; and from specimens already examined appears to be a regular formation.

195. The civil divisions of Chili are as follow: all the territory below the river Biobio in latitude 36° 50′ S. is in the possession of various tribes of independent Indians. The remaining portion, extending from the above river to the northern boundary, is inhabited by Spaniards, and divided into the following districts: Copiapo, Huasco, Coquimbo, Cuzcos, Petorca, Quillota, Melipilla, Rancagua, Colchagua, Curico, Maule, Cauguenes, Itata, Puchacay, Conception, Aconcagua, Santa Rosa, Mapocho, Isla de Maule, Chillan, Rere, Isla de la Laxa. According to a census taken about the year 1812, the population was 1,200,000, exclusive of independent tribes of Indians; and the island of Chiloe, and neighbouring islands added since, have a population of 26,000. Chili has been divided into three intendancies, viz.: Coquimbo, St. Jago, and Conception; and the present population, exclusive of the Indians, has been stated by an intelligent traveller at about 600,000. Of the population of the Araucanos little or nothing is known.

196. The chief towns are the following: St. Jago the capital is in lat. 33° 20′ S. seated in a delightful plain on the south bank of the Mapocho, a branch of the Maypo, ninety miles from the ocean, and twenty-one from the Andes. The city is regularly laid out, the streets intersecting each other at right angles, and enclosing in the middle a spacious open square, on the sides of which are the principal buildings, and in the centre a beautiful fountain. The spacious cathedral was planned and built by two Englishmen; besides which there are numerous churches, convents, chapels, and hospitals. No university exists, but there is a large public school at the institute, where 400 boys are educated at the public expense. At this institution the candidates for holy orders are examined and licensed. There is a public library, consisting of many thousand volumes and many curious MSS. relating to the early history of the country, under the care of Don Manuel de Salas. Valparaiso, the port of St. Jago, and the most commercial city

in the kingdom, is seated on a high rugged promontory which, projecting into the ocean, forms with the shore a deep crescent, the cavity of which opening to the north forms the harbour. The town is scattered irregularly not only on the beach, but over the hills and ravines of the promontory, and contains a population of 6500 souls. Conception, in point of rank, the second city of Chili, contains 13,000 inhabitants, and is seated on the north side of Biobio, a league from the sea. It was originally built three leagues north of its present situation; but, having been twice destroyed by an earthquake, the inhabitants removed to the present site. Talcaguano, the port of this city, is six miles to the south-west in the bay of Conception. This bay is one of the largest in the Pacific Ocean, being ten miles long from north to south, and nine from west to east; and opening to the north is divided by the island of Quiriquina into two channels. Under the south side of this island is good anchorage; and also at the south-west extremity of the bay opposite Talcaguano.

197. In addition to the above, the most important sea-ports are: 1. Copiapo, at the mouth of the river of the same name, in lat. 27° 15′ S. 2. Coquimbo, or La Serana, in lat. 29° 54′, on the south bank of the river of the same name. Its harbour is a fine capacious bay, easy of access, protected from all winds, and from the swell of the sea. 3. The port of Valdivia in lat. 39° 50′ is one of the safest, strongest, and most capacious harbours in the western coast of the new continent.

198. The internal communication is indifferent. There are but three carriage-roads in the whole country, viz. two from Santiago to Valparaiso, and one from the former city to Conception. Besides these there is no road in which a carriage can travel with safety out of the particular valley to which it belongs. The commerce with Buenos Ayres is chiefly carried on through the passes of the Andes, of which the most frequented is that of Putaendo on the Uspallata, on the road between Santiago and Mendoza.

199. Chili, when a Spanish colony, imported European goods from the parent kingdom to the amount of more than a million of dollars annually, and the returns were principally in gold and silver. Since her independence the imports have been chiefly from Great Britain and the United States, consisting of arms, ammunition, iron, furniture, tobacco, and French, India, and British, manufactures. The returns have been gold, silver, copper, tin, wheat, hides, hemp, &c. The army in 1818 consisted of 8400 troops; the navy, of one vessel of fifty-two guns, one of thirty-six, and several smaller vessels, manned by Americans and Englishmen.

200. When the Spaniards possessed Chili, they derived no revenue from it; the alcbala, the royal fifths on the precious metals, and other inland taxes, being scarcely sufficient to defray the expenses of the government; but the possession of this country was quite necessary for the safety of Peru. The revenue for 1817 was 2,177,967 dollars. The chief source of the revenue at present is derived from the duty of 26½ per cent. on foreign merchandize, forming 4-5ths of the whole amount of the treasury returns. In May, 1822, a loan was contracted in London to the amount of a million sterling.

201. The religion by law established is the Roman Catholic, and the church is very rich. There are said to be 10,000 monks and nuns in Chili; and the religious institutions with which they are connected, monopolize nearly one-third of all the landed property in the country, The connexion between Chili and the court of Rome has never been entirely suspended. Soon after the revolution an agent was sent to Rome, where he continued till 1823, and was recalled on account of the expense. The pope offered to send a nuncio to Chili to regulate the affairs of the church; but this was declined also for the same reason.

202. Of the history of Chili before the middle of the fifteenth century, little is known; but in 1450, Upanqui, governor of Peru, determined upon its conquest, and despatched one of his princes, who extended his victories as far as the Rapal river, where he was defeated by the Promancian tribe. The Peruvians, however, retained possession until 1535, when the country was first visited by the Spaniards. Almagro, the companion of Pizarro, collected a force of 570 Spaniards and 15,000 Peruvians; and crossing the mountains reached the province of Copiapo. The Spaniards were received by the natives with respect; but a massacre of some of their chief men by order of Almagro roused their indignation, and led to the defeat of the Spaniards, and their consequent return to Peru in 1538. Two years afterwards Pizarro detached Pedro de Valdivia, with 200 Spaniards and a body of Peruvians, with women, monks and cattle, to Chili, to settle such districts as he should conquer. The natives of Copiapo opposed him, but having conquered several districts he arrived at the country of Mapocho, where he founded the city of Santiago on the 24th of February, 1541. Going out to attack the Promancians, the Mapochians attacked the new settlement, and continued a formidable scale of opposition for six years. In 1545 Valdivia made the Promancians his allies; and visiting Peru on his return brought with him a commissioner, a governor, soldiers, and stores. The city of Coquimbo was rebuilt by Aquirre. Valdivia, in 1550, founded the city of Conception, and was soon afterwards attacked by the Araucanians; but, receiving reinforcements from Peru, he marched into Arauco where he founded the city of Imperial; and traversing the country as far as the territory of the Cunches, and founding another town on which he conferred his own name, returned to Santiago.

203. The Araucanians shortly after overthrew his power and took him prisoner, when an old chief killed him with a club. Villagran succeeded him in the command; but the opposition of the Araucanians impeded the progress of the settlements. In 1557 the viceroy of Peru sent Don Garcia de Mendoza, his son, with a large force, who succeeding indifferently returned to Peru. Villagran succeeding died soon after, and was succeeded by his son Pedro. In 1598, an insurrection of the Araucanians taking place,

every Spaniard found outside the forts was put to death; Villanca, Valdivia, Imperial, and other towns, were taken, and Conception and Chillar were burnt. The Dutch too landed in the islands of Chiloe, plundered Chiloe, and put the Spanish garrison to the sword. In 1641 peace was concluded between the marquis of Baydes, governor of Chili, and the Araucanians, which lasted till 1655; when, after an interruption of ten years' hostilities, harmony was once more restored. In 1722 a conspiracy was formed by the nations from the borders of Peru to the river Biobio. At a fixed moment, when the watch-fires were to blaze upon the mountains, the Indians were to rise against the whites and deliver the country. The design however miscarried, and peace was shortly concluded. In 1742 Don Josef Manto, the governor, collected the colonists into towns, divided the country into provinces, and founded several new cities. In 1770 an attempt of the same kind, with respect to the Araucanians, made by Don Antonio Gonzago, produced a new war, which continued till 1773, when peace succeeded, and the Araucanians agreed to keep a resident minister at Santiago.

204. Chili appears to have enjoyed tranquillity during the remaining part of the eighteenth century, and agriculture and commerce revived. The occupation of Spain by the French in 1809 led to a revolutionary movement in Chili, which was at first successful. On the 18th of July, 1810, the captain-general resigned, a junta was formed, and all native Spaniards desired to quit the country within a stated period; the governor of Valdivia, who endeavoured to effect a counter-revolution, was taken prisoner and executed; but in 1814 nearly the whole district was subdued by a royalist army from Peru. In 1817 the able conduct of General San Martin, with a body of troops from Buenos Ayres, led to the defeat of the royalists and the freedom of the country. A junta was formed, and D. Bernardo O'Higgins became director. A battle fought on the 5th of April, 1818, almost extinguished every hope of the royalists; and Lord Cochrane, who had the command of the Chilian naval force, declared the whole country, from Guayaquil in the north, to the desert of Atacama in the south, to be in a state of blockade.

205. In 1820, August 20th, an army of Chilians, under the command of San Martin, was sent against the Spanish empire in Peru. This general, after conquering Peru, retired to Chili as a private individual. On the 28th of January, 1823, O'Higgins resigned the dictatorship; and General Freire, who had been active in the cause, being declared commander-in-chief, took the government. In September the same year took place the last revolutionary movement of which we have any information, when the royal standard was hoisted near Conception, and shortly put down. A free constitution has been formed, and the government is popular.

206. The British possessions in South America comprise the whole of what was originally called Dutch America, or Dutch Guiana, a country extending from the mouth of the Orinoco to that of the Marowne, or from the fifth to the seventh degree of north latitude. It is bounded on the north by the Atlantic Ocean; east by Cayenne or French Guiana; south by the unexplored country called Amazonia; and west by Spanish Guiana.

207. This territory is divided into the three governments of Berbice, Essequibo and Demerara, and Surinam; Essequibo and Demerara being two districts under one government. See the separate articles.

208. The country of Guiana may be said to have become first known to Europe by the voyage of Sir Walter Raleigh up the Orinoco in 1595, in search of the imaginary city of El Dorado, whose streets were declared to be paved with gold. Columbus had seen this coast in 1458 according to some accounts; while others attribute the discovery of it to Vasco Nunez in 1504. Raleigh penetrated the country in his expedition on the Orinoco to the extent of 600 miles. After him we find the English buccaniers resorting to the coast; and in 1634 a mixed colony of sixty individuals, partly English and partly French, settled in Surinam to cultivate tobacco; and traded along the whole of those shores. After an unsupported struggle with their difficulties for about twenty years, these settlers were taken under the protection of the British government, and Lord Willoughby, of Parham, was appointed their governor by charter in 1662. Paramaibo is supposed to derive its name from this nobleman. In 1667 the Dutch attacked and took possession of the colonial establishments; which were shortly afterwards confirmed to them by the treaty of Westminster, in exchange for New York. Thus ended our early connection with this coast. During the American war, the Dutch settlements on the banks of the Essequibo were captured by a small English armament; but at the peace of 1783 they were restored to the States General. In 1796 Berbice and Demerary submitted to our arms, and in 1799 the valuable colony of Surinam, completing the conquest of what was called Dutch America. Again, however, were these possessions restored to Holland, in full sovereignty by the peace of Amiens. Shortly after their arrival, the Dutch troops sent to take possession of Berbice, being very ill equipped from home, broke out into mutiny against the colonial authorities, and war being again declared between Holland and Great Britain, General Greenfield and Sir Samuel Hood appeared before the place. In September, 1813, this settlement surrendered to their joint attack; and the same year saw us masters of Demerara and Surinam. The whole of these settlements were finally confirmed to Great Britain by the treaty of Paris in 1814.

209. The inaccessibility of this coast (for it can be approached only at the mouth of its great rivers), and its uncultivated appearance from the sea, induced some of the early European navigators to call it the Wild Coast, and these circumstances seem to have led to the fallacious conclusion that no colony would flourish near the ocean. Accordingly we find the first settlers, particularly the Dutch, planting themselves at a considerable distance from the shore; and this policy was not wholly abandoned until the

modern possession of these settlements by Great Britain. The soil is so exceedingly rich to the very borders of the Atlantic, that for ten or twelve feet below the surface it is equal to the manure of most countries, and portions of it have been carried to Barbadoes to be used as such. These lands are so low as to be covered with water in the rainy season to the depth of eighteen inches; and the whole country is intersected with swamps and marshes. The interior beyond the settlement has been but little explored, but as it becomes more hilly toward the Mei Mountains, the land is poorer, sandy, and stony. From these mountains, which run nearly in the form of the coast, the numerous rivers of the district descend; some of them, as the Essequibo, falling direct into the Atlantic, others into the Amazons and Orinoco. Between this range and the shore thirty crops of rice can be raised on the land, successively, whilst the richest of the West India islands will yield but two.

210. Here are two summers or dry seasons, distinguished as the greater or less; and two winters or wet seasons, similarly distinguished; the greater or longer wet season beginning at the middle of April, and terminating at September, when the third dry season commences and lasts till the middle of November. The short wet season now comes on, and continues until the middle of January, when it is succeeded by the long dry season which ceases in April. The last is a most delightful period of the year. The trade-wind sweeping over the Atlantic from east to west, aided by a sea breeze which generally blows from the north-east during the day, keeps the whole atmosphere cool and fresh until the evening; when the latter is succeeded by a land breeze from the south-east, which prepares the constitution for the chillness of the night. Indeed, the climate of Guiana, as a whole, has been thought to be the most congenial to Europeans of any country within the tropics. During the wet season the rain falls in torrents towards the close of the day, and rarely in the driest season is the night without showers. The changes of the season are accompanied with heavy storms of thunder and lightning, but the desolating hurricanes of the West Indies are unknown here, and the earthquakes of other parts of South America are rarely felt. Since the lands have been more cleared, the return of the seasons has been observed to be not quite so regular; and the rains are naturally less frequent. Europeans should avoid the heat of noon and the evening dews, as most liable to expose them to the fever of the climate. It appears occasionally in all degrees from the simple intermittent to the yellow fever. Leprosy is also a frequent and very severe disorder here. A dreadful infectious disease, called the yaws, similar to the small-pox, seems peculiar to the negroes whose persons it covers with large ulcers. The bloody flux, dropsy, and dry gripes, are also frequent. The tickling feeling of the skin which is sometimes common, accompanied with a scarlet eruption, has been thought conducive to health; but the stings of musquitoes, and gnats, are succeeded by large pimples, which if scratched become ulcers. Similar annoyances are found in the ring-worm, which spreads in large scarlet spots about the face and neck, and is cured by an application of lime juice mixed with gunpowder; and the sting of the chigoe, or jiger, a kind of sand-flea, which lodges under the toe-nails between the skin and the flesh.

211. The principal rivers of this part of Guiana, are the Essequibo, Surinam, Demerara, Berbice, and Canje. The Essequibo has a course of upwards of 300 miles in length, and is twenty-one miles wide at its mouth. The Surinam is three quarters of a mile in width at the mouth, and navigable for the largest vessels full twelve miles from the ocean: smaller craft proceed sixty or seventy miles further. Near the mouth, at the junction of the Commanwine with the Surinam, is a fort of two redoubts, but of no considerable strength. The banks of the river, covered with the evergreen mangrove, furnish some of the most pleasing prospects of the country. The Demerara, which runs from south to north, is navigable for 200 miles to vessels which can pass the bar of sand at its mouth; where there is only about twenty-four feet water at the highest tides, and the difference between high and low water mark is from ten to twelve feet. At its mouth, opposite the fortification, it is about two miles wide; twelve miles above the fort it lessens to about a mile in width. The Berbice is a quarter of a mile wide and two fathoms deep at its mouth, having the land on both sides extremely low and covered with wood. The plantations extend 300 miles from its entrance into the sea. The Canje, running nearly due-east, is a fine, and, at its rise, a most romantic stream: the colony schooners navigate it three miles up.. Immense falls and cataracts break its way down the mountains; and a creek about forty miles below connects it with the Courantine, by means of which despatches are brought from Surinam to Berbice.

212. The productions of the whole of this district being so very similar, we shall proceed to describe them in this place, leaving only the peculiarities of the separate settlements to be noticed in distinct articles. In the numerous forests of the coast are found—the jaguar tiger, which sometimes measures from five feet and a half to six feet, from the nose to the root of the tail—the couquar, or red tiger, resembling a large grey-hound—and the tiger cat, a very destructive but beautiful little animal: it is called the crabbo dago by the inhabitants, and seems to correspond with Buffon's grey-weasel or grison. Numerous tribes of monkies are found in Guiana, but no apes. Of these the quato has a naked face, eyes sunken, a negro nose, large ears, and excepting its long tail, an almost entire resemblance to the human form. The howling baboon has a large black beard and is generally found to muster in crowds and utter a horrid yell, which is heard for immense distances previous to the coming on of rain. The lion-monkey, called by the natives the saccawinkee or schacomingky, is a delicate little animal of the same species, which weighs only about five or six ounces, has a small head, round smooth ears, and an oval face covered with fine white hair. Round its neck is a long bushy mane resembling that of a lion; it will

perch on the hand like a bird, and is often brought to the plantations for sale. The coatimondi or Brazilian weasel, the ant-bear and several species of opossum, the sloth, the porcupine, armadillo, and hedge-hog, complete the list of animals of prey found in this district. Of these the ant-bear deserves some particular notice. From the snout to the end of the tail this creature will sometimes measure seven or eight feet; its head, which is small compared to its entire size, is covered with a soft hair; while its tail, immensely large, is set with strong bristles which constitute a complete armour for the animal when attacked, and under which during a storm it will sometimes cover its body. With its tongue, which is often two feet in length, and from which it discharges a sweet saliva, it perforates the abode of the ants, who will immediately settle on it in vast numbers, and thus become the prey of their enemy. Herds of deer of all sizes range along the savannas; the paccarara, or Indian coney, resembling our hare, is also common; and abundance of wild hogs. There is one species of the latter indigenous to Guiana, having neither tail nor tusks, but remarkable for a receptacle on its back about an inch deep, in which is a white fetid liquid that must be carefully discharged from the flesh immediately the animal is killed, or it renders the whole carcase unfit to be eaten. The domestic animals have been principally exported from the Old World, and the whole, except the hog, have degenerated here. The sheep, in particular, are very diminutive, and the wool, as at the Cape of Good Hope, changed to a sort of coarse hair. Beautiful goats abound, and the finest poultry. Forest and fruit trees of the most curious description line this coast. The mountain cabbage, as it is strangely called, stands unequalled among the vegetable tribes. A perpendicular tapering stem, from seven to eight feet in circumference, rises to the height of about 100 feet; and is surmounted by the cabbage consisting of thin white strata, and tasting like an almond. Branches twenty feet long diverge from the stem, having narrow leaves of about two feet in length, and full of nuts which are the seeds of the plant. The iron-wood, bullet, launa, and mahogany trees, grow to the height of fifty feet; the two first are remarkably hard and close grained; the launa yields a fruit resembling our apple, with the juice of which the natives paint their bodies. The red mangrove, the cocoa, the pipetra, and the tonquin-bean trees rise from sixty to eighty feet in height; the first being remarkable for its ligneous shoots which descend to the ground without leaves or branches, and take spontaneous root, as if for the support of the parent stem. It is an exceedingly fine tree for building purposes. Beautiful woods for furniture diversify the forests; the hiarree, which is said rarely to be found growing amongst other trees, is so strongly imbued with poison that when it has been accidentally burnt the smoke has often proved fatal to human life.

213. Bananas, pine-apples, and plantains, are among the fruits of this shore; but the tamarind, the guava, and the aviato pear, are its choicest productions. The guava is a round lemon-coloured fruit, containing a red pulp, generally made into jellies, the solid coating of which is of the substance of an apple, and similarly used by the settlers. The aviato or avagato pear bears a fruit in shape like our English pear, but of a pale green colour, having the taste of a peach. The useful shrubs comprise the cotton bush, which bears two crops annually; the coffee bush, which also bears two crops, each tree yielding about a pound and a half at a crop; the palma christi, or castor bush, which bears nuts of a triangular form covered with a thin brown fur, the kernels yielding, by expression, the well-known castor oil; the cassava shrub, of which the roots are ground into meal and form an excellent bread, but the bitter cassava, though it becomes a wholesome food when boiled or baked, is a fatal poison in its raw state. The curetta, or silk-grass plant is a curious species of aloe, abounding here, containing in its leaves a saponaceous pulp, interspersed with strong white silky filaments, which are used for making nets, and fine cordage. Other species of the aloe, the caruna shrub, whose kernel is a slow poison; the troolies shrub and the nibbees, are also common. The troolies bears a leaf of from twenty to thirty feet in length, and two or three feet broad, which grows from its short roots close to the ground, and is so tough and useful as to form the principal thatch of many of the houses of the colony; from which it will turn for years the heaviest rains of the wet season. The nibbees is a sort of natural rope growing to immense lengths, and running from six to eighteen inches in circumference, sometimes twisted together like the wrought ropes of Europe, and at other times crossed in its texture like net-work. It is used for many of the ordinary purposes of rope. The Indian yarn also abounds here; and the ipecacuanha and ginger roots.

214. The coast is rich in amphibious animals. The sea-cow is perhaps the most curious of them, being sixteen feet or upwards in length, and having a head like that of a hog, the nostrils of an ox, the breast of the human female, and the tail of a whale. It seldom quits the water, but when taken is considered very palatable food. The tapira is an inferior hippopotamus, not bigger than an ass; it is not often seen, but considered very fine eating. The head is that of a horse, with a long upper lip, bristly mane, and very thick skin. Alligators are sometimes found here measuring twenty feet in length, but they are generally very harmless animals. The laubba, or aquatic hare, sometimes called the paca, or spotted cavey, is peculiar to this coast. It has the head, and is about the size, of a white French dog; its flesh, when killed, eats like the finest pork, and is generally very fat. Another amphibious animal of these regions is remarkable for its mode of propagation: it is called the pipa, and is an ugly creature of about the size of a duck, covered with a brown shrivelled skin, and having a remarkably loud shriek. The young are said to be hatched in watery cells on the back of the female, or placed there, according to some accounts, as tadpoles, by the assistance of the male; certain it is they are

found nestling in this situation until they assume the shape and appearance of their species.

215. Of the reptiles that are found here we need only mention the rattle-snake, whip-snake, dipsas, and oroocookoo, all of which are highly venomous; the bite of the last has been known to be fatal in a few minutes. Here is also a large amphibious serpent, called the aboma, measuring from thirty to forty feet long when full grown, and three to four feet in circumference. It is not venomous, but very voracious, and will attack animals of all sizes, not even excepting lions, by surprise, and crush them in its slimy folds.

216. The eagle, vulture, falcon, owl, and butcher-bird, are the principal species of the feathered tribes that haunt this shore. Beautiful parrots, mackaws, and the flamingo in immense flocks and very tame, are found everywhere; together with the agame or trumpeter, a native turkey of this climate; the sun-bird, a kind of patridge, sometimes kept in the houses to destroy ants; the peacock-pheasant, resembling our turkey in size and taste; the humming-bird; mocking-bird; and bat. The varieties of the humming-bird are nowhere exceeded in beauty. The most common is not bigger than a full-sized cherry, and the smallest of a black and green plumage, tufted with gold, is one-third less than this, and weighs not more than fifty grains. The mocking-bird is remarkable for contriving to place its nest out of the reach of its enemy, the monkey, at the extremity of the remotest twigs of the forest. These nests are sometimes fifteen or sixteen inches long, by eight or nine in circumference. The bat has been known to open the veins of the human feet when persons were asleep, and satiate itself with their blood.

217. Among the fish of this coast the galvanic eel is very common, and generally measures about two feet in length by one foot or fourteen inches in circumference. Its flesh is much esteemed by the natives. The frog-fish is, however, the most remarkable of the finny tribes. It is said to pass successively through the forms of a frog, a frog-fish, and lastly a fish; in which size it is about eight or ten inches long without scales and very delicate food. Stedman thinks the progress is reversed, and that it proceeds from the form of a fish to that of a frog.

218. The insects of Guiana are its greatest pest. They consist of musquitoes, scorpions, centipedes, cock-roaches, ants, a peculiar kind of bee, (which is said regularly to attack strangers, but never to molest the inhabitants,) grasshoppers, and enormous spiders. The ant-hills are a natural curiosity of the coast, and are often so high as to resemble, at a distance, the appearance of a black or brown bear. They have even been found of the height of fifteen or twenty feet, and 100 feet in circumference. Some of their inhabitants grow to the size of an inch in length, and give a most painful bite.

219. The native tribes of Indians, on this coast, exhibit very striking peculiarities. Nothwithstanding all the efforts of the Dutch during their long possession of these colonies, and the devotion of a considerable annual sum to the purchase of hatchets, blue cloth, beads, and trinkets, as presents to them, (a system which has been scrupulously followed and improved since the district has come into the hands of the British) these ancient possessors of the soil remain shy of the colonists. Sometimes they will engage in their service as wood-cutters, but will often suddenly depart into the interior, and have little application to any steady employ. To the negroes, however, they have a still greater antipathy than to their masters, and having imbibed the liberal notions of those who consider them an inferior species, will frequently assist the colonists in getting them back from the woods. As independent traders they appear at the settlements with ebony, canoes, cotton hammocks, wax, baskets, coarse earthen-pots, balsam of capivi, arnetto, wild nutmeg, cinnamon, parrots, monkeys, the beautiful birds, and curious woods of these forests, and their prisoners of war as slaves; for which they take back rum, fire-arms, hatchets, gunpowder, knives, scissars, looking-glasses, fish-hooks, combs, needles, pins, beads, chequered cloth, &c. They are divided into six principal tribes, of which the Accawaws, who live near the sources of the Berbice, Demerara, and Essequibo, are the most sagacious; they are tall in stature, of a light dun complexion, and have intelligent and rather agreeable features, straight black hair, without beards, high cheek-bones, and broad shoulders. The Caribs, of similar appearance, who dwell between the Essequibo and Orinoco, are the largest and most warlike of these tribes. They have an inveterate animosity against the Spaniards, but the Dutch generally conciliated their favour. The use of poison in their weapons is common to all these tribes, and the Caribs have been said to indulge the horrid practices of cannibalism. At home their dwellings are surrounded with well-cultivated fields of cassava and plantains, and they are fond of hunting and fishing. The Worrows are found on the coast between Surinam and Demerara. They are the most barbarous and disagreeable in appearance, as well as the most filthy in their habits, of any of its inhabitants; and so lazy that their slight clothing is generally nothing better than the bark of trees, while they are said to live principally on raw shell-fish and water. Behind their habitations toward the interior, reside the Arrowaws, a docile and very friendly race; comparatively handsome in their persons, and fond of intercourse with the European settlers. Other tribes more remote are the Taiiras and Piannocataws, the former as peaceable and indolent as the latter are warlike and determined in their hatred against all the colonists of the coast. On the whole, it is hardly to be doubted that the liberal British policy of diffusing the blessings of our empire wherever we maintain its sway, will ultimately render our connexion with this coast an epoch of abiding comfort and conciliation to its native tribes, possessing as they do some of the most promising dispositions towards civilization; while in the present situation of the world, and particularly of the neighbouring Spanish colonies, these settlements, duly cultivated, may

become important emporiums of British commerce.

220. The agricultural system of the whole district is much alike. The colonial establishments and plantations are generally on the banks of the rivers and creeks, and contain from 500 to 2000 acres each, divided into sugar, coffee, cocoa, and cotton grounds. The low situation of the plantations has induced the colonists to adopt a similar mode of drainage to that which is pursued in the fenny counties of England. Straight deep ditches, defended by sluices, carry off the redundant water to the rivers, while similar ones intersect every part of the farms, and are navigated by flat-bottomed boats which carry the produce to and fro. The beds between these and smaller trenches are sometimes not more than from thirty to thirty-two feet in breadth; and being raised by the excavated earth, they are found to contain the best spots in the colony for the cotton tree, which is planted in rows six feet asunder. The coffee plant is cultivated under the shades of the plantain or some loftier tree, in rows at from nine to twelve feet distance from each other. The soil is universally clayey, and whenever it becomes impoverished is left under water for a time, perhaps a year or two, while another piece of woodland is cleared, manure being wholly unknown here. Agricultural labour is chiefly performed by the negro slaves. Expedients, however, are more frequently necessary to diminish the richness of the soil. This is done by cropping it two or three years with plantains, and then with sugar-canes; the latter of which, for two or three crops, will sometimes be so luxuriant as to be unfit for any thing but the manufacture of rum. Abundance of fresh-water fish are found in the rivers, and at some seasons of the year there is a plentiful supply of turtle.

221. In consideration of the habits and interests of the Dutch parts of the population, peculiar privileges in favour of intercourse between these settlements and the kingdom of the Netherlands are secured to them by 56 Geo. III. c. 91. The entire number of acres in cultivation throughout the whole district has been recently estimated at 1,500,000. For CAYENNE, the French island and settlement, see that article.

We have thus devoted that considerable space to the consideration of America, geography, and politics, which we conceive their importance on the scale of nations, an importance every day increasing, to demand. Some of the most interesting occurrences, and noblest lessons of history, have been supplied by the progress of these regions to civilization and liberty, within the last fifty years. Half a century ago the northern continent was just emerging from obscurity, and buckling on her armour for the struggle of independence of Great Britain. France, in yielding her aid on that occasion, imbibed involuntarily a portion of her spirit; the French followed the North American revolution; and if the licentiousness of her new liberty ended in the temporary establishment of a despot in France, her measures in the Peninsula, and the conflicts of Europe arising out of these important changes, gave, in return, to South America, opportunity and encouragement to break her chains. It must be obvious that the complete emancipation of so large a portion of the globe from its original barbarism, and more recent colonial tyranny, is full of bright hopes for posterity; that the infant nations of the southern continent in particular have a noble destiny to fulfil, and that the western world is assuming a magnificence in her political character and prospects fully commensurate with her geographical features.

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AMERICAN COMPANY, the RUSSIAN, a company originally projected in the middle of the last century, by two Russian mercantile houses of the names of Schelikoff and Golikoff, and formed in 1785 into a regular company, to encourage the fur-trade. Schelikoff himself was the commander of its early adventures. They erected a chain of factories protected by forts on most of the Aleutian islands. The emperor Paul was at one time disposed to suppress the association, when the company pledged itself, through its agent M. Von Resanoff, to more regular proceedings. The late emperor took it under his particular patronage; and his intelligent minister Romanzoff introduced many useful changes in its constitution. The condition of the fur-collectors of the company, called promuschleniks, is said, however, to be still wretched, and only to be exceeded by that of the oppressed Aleutians, who are, in turn, their slaves, and from whom their staple-trade has been almost entirely wrested.

AMERICANA, in entomology, a species of American chrysomela, and of which a variety is found in the south of France. The general colour is greenish gold, with five sanguineous red lines upon the wing-cases. *Fab. & Gmel.* It feeds on the lavandula.

AMERICANORUM, in entomology, a species of American apis, described by Fabricius. It is hairy and black; anterior part of the thorax yellow; abdomen yellow, black at the end. *Fab. Spec. Ins.*

AMERICIMA, in zoology, a species of lizard in Brazil, very small, being not above two inches and a half long, and of the thickness of a swan's

quill. Its body appears square and is covered with glossy scales; its feet are not thicker than hogs' bristles. It is reckoned poisonous.

AMERICUS VESPUCIUS, or VESPUCCI. See VESPUCCI, and AMERICA, section 6.

AMERIMNUM, or AMERIMNON, in botany, a genus of the diadelphia decandria class and order, of the natural order of papilionaceæ or leguminosæ; the characters of which are: CAL. a one-leafed perianthium, tube bell-shaped, five-toothed, the teeth sharp: COR. papilionaceous, standard with an oblong claw, roundish, heart-shaped, expanding and convex, wings lanceolate, shorter than the standard, and keel short; the stamina have ten filaments conjoined, anthers roundish: PIST. a germ pedicelled, oblong, compressed, leafy, varicose, with lateral veins, within woody, not gaping; cells disposed longitudinally within: SEEDS solitary, kidney-shaped, thicker at the base, appendicled at the top. There are two species, viz. 1. A. Brownei, a native of Carthagena, Jamaica, and Domingo. 2. A. Ebenus, prickly A. or Jamaica ebony, pterocarpus sessilifolius of Lin. p. buxifolius of Murray and Aiton.

AMERKOTE, or AMARAKATA, the fort of the immortals. A town in the province of Sinde, situated about thirty miles east from the river Indus. Lat. 26° 23′ N., long. 70° 24′ E. It was formerly an independent principality, held by the Jada Rapoots; but, standing on the frontier of Joudpoor and Sandi, was seized by the rajah of Joudpoor, to whom it now belongs. The emperor Akbar was born here.

AMERONGIN, a lordship and town of the Netherlands, in the district of Zeyst, province of Utrecht, fourteen miles east-south-east of Utrecht. Inhabitants about 1000.

AMERSFORT, a city of the Netherlands, in Utrecht, seated on the Ems, twelve miles east of Utrecht, and thirty-two south of Amsterdam. The most remarkable buildings are the town-house; the grand palace, which is triangular; and the great church, dedicated to St. George. It had a vote among the states of the province before the revolution; but afterwards became the capital of the quarter of Zoesdyk, in the department of Utrecht; and was made in 1810 the head of a canton in the French department of the Zuyder Zee. The land to the east and south is very fruitful; on the north there is pasture ground, and on the west it is woody. It has a manufacture of dimity and bombazines, a glass-house, and a good trade in corn. Population about 8000. Long. 5° 40′ E. lat. 52° 11′ N.

AMERSHAM, or AGMONDESHAM, an ancient borough and market-town in Buckinghamshire, consisting of about 500 houses, with a free school, and four alms-houses. It is situated on the Chiltern hills, near the river Coln, and consists of a long street on the road-side from Uxbridge to Buckingham, divided in the middle by a shorter cross street. In the angle stands the church, a Gothic structure. It lies twelve miles from Aylesbury, twenty-six south-east of Buckingham, and twenty-six north-west of London, and is the best rectory in the county. It sends two members to parliament; has a market on Tuesday; two fairs, on Whit-Monday and 29th September; and has a good trade in black lace. The market-house is a very handsome structure with a lantern.

AMES (William, D. D.), a learned Calvinistic divine, in the reigns of James I. and Charles I. famous for his controversial writings, which are now but little known. He was of a respectable Norfolk family; born in 1576. He died at Rotterdam in 1633. He wrote, 1. A fresh Suit against the Ceremonies. 2. Lectiones in Psalmos Davidis. 3. Medulla Theologiæ; and several scientific pieces.

AMES (Joseph), secretary to the society of antiquaries, was originally a ship-chandler in Wapping. He devoted himself to the study of antiquities, in which he acquired great eminence, and published a work, entitled Typographical Antiquities, being an historical account of printing in England, with some memoirs of our ancient printers. His principal works are:—1. Catalogue of English Printers from 1471 to 1700. 4to. 2. An Index to Lord Pembroke's Coins. 3. A Catalogue of English Heads, or, an account of 2000 English prints, describing what is peculiar to each. 4. Parentalia, or Memoirs of the family of Wren, 1750, folio. He died in 1759.

AMES (Fisher), one of the most celebrated native writers of the United States, was born April 9, 1758, at Dedham, nine miles south of Boston. His father, Dr. Nathaniel Ames, a physician, died in 1764, leaving his mother with four sons and one daughter; Fisher being the youngest: and though his mother was left in narrow circumstances, she determined to afford him a good education. He accordingly began to study the Latin when he was six years of age, and in July, 1770, was admitted to Harvard College. Here the singular union of modesty and vivacity in his manners endeared him both to his companions and his instructors. Mr. Ames was early celebrated for extemporaneous eloquence. Though resolved to practise the law, he was several years before he entered on a course of professional study; and maintained himself at this period chiefly by teaching a school. At length he commenced his professional career at Dedham in 1781, and was soon distinguished as a superior pleader. In the contest between the colonies and the mother-country Mr. Ames steadily opposed the forcing a depreciated paper currency on his countrymen; and took a considerable share in the convention for ratifying the federal constitution in 1788. He was chosen the same year a member of the house of representatives; and for eight years continued a firm supporter of Washington's administration. In the controversy which took place between Britain and America respecting the privileges of neutral powers during war, he espoused the cause of the belligerent, pleading warmly for the exercise of the maritime rights of Britain in their full extent, and steady in his hostility to the policy of France. He retired from public business in 1796, but continued to furnish the press of the United States with some of its best political essays until 1802. He died on the 4th of July, 1804.

AMESBURY, or AMBRESBURY, a market-

town in Wiltshire, in the hundred of the same name, six miles north from Salisbury and seventy-seven from London. It is seated on the Avon, and but two miles from the famous Stonehenge. The church is in the centre of the town at the intersection of the two streets of which it is composed. Good pipe-clay is found in the neighbourhood, and the Avon abounds with loach. The charity school is endowed for fifteen boys and as many girls. It is said to have derived its name from king Ambrosius Aurelius, who rebuilt the monastery and abbey which was destroyed by the Saxons. This establishment was afterwards changed into a Benedictine convent, to which queen Eleanor retired, and died there. When it was surrendered, in the thirty-second Henry VIII., it was valued according to Speed at £558 10*s.* 2*d.* per annum. Ruins of this place are still seen. Mr. Addison was born at Milston near this place. Inhabitants about 1000. There was a large Roman encampment near Amesbury defended on both sides by the Avon. See Stonehenge.

Amesbury, a town of Massachusetts in North America, in Essex county, standing on the north-west bank of the Merrimac. It is about four miles north-west of Newbury Port. Population about 2500.

AMESTRATA, or Amestratos, in ancient geography, a town of Sicily, called also Amastris, and Multistratos: now Mistretta, in the Val di Demona, on the river Halesus. It was a very strong fort of the Carthaginians, and besieged in vain by the Romans for seven months; but at length, after another siege, taken and rased.

AMESTRIS, in ancient history, wife of Xerxes, king of Persia. She cut off the nose, ears, lips, breast, tongue, and eyebrows, of her husband's mistress. She also buried alive fourteen noble Persian youths, to appease the deities under the earth. *Herodot.* l. 7, c. 61. l. 9. c. 111.

AM'ETHYST, } Ἀμέθυστος, *non ebrius, a*
Amethystine. } μέθυ, from wine; restraining from wine. Applied to the name of a certain jewel according to Pliny, because it resists drunkenness; an opinion which Plutarch rejects. *Sym.* i. 3.

A precious stone of a violet colour, bordering on purple. The oriental *amethyst* is the hardest, scarcest, and most valuable; it is generally of a dove colour, though some are purple, and others white like the diamond. The German is of a violet colour, and the Spanish are of three sorts; the best are the blackest or deepest violet; others are almost quite white, and some few tinctured with yellow. The *amethyst* is not extremely hard, but easy to be engraved upon, and is next in value to the emerald. *Savary. Chambers.*

Some stones approached the granate complexion; and several nearly resembled the *amethyst*.
Woodward.

Pen. Alack, alack, his lips be wond'rous cold;
Dear soul he 's lost his colour: have ye seen
A straying heart? all crannies, every drop
Of blood is turned to an *amethyst*,
Which married bachelors hang in their ears.
Ford's Broken Heart, act iv. sc. 2.

From thee the sapphire, solid ether, takes
Its hue cerulean; and, of evening tinct,
The purple streaming *amethyst* is thine.
Thomson's Summer.

High on silver wheels
The iv'ry car with azure sapphires shone,—
The pearl, th' empurpled *amethyst*, and all
The various gems, which India's mines afford,
To deck the pomp of kings.
Glover's Leonidas, book iv.

A kind of *amethystine* flint, not composed of crystals or grains, but one entire massy stone. *Grew.*

Amethyst, among mineralogists, is more particularly described as a transparent gem of a purple or violet colour, composed of a strong blue and a deep red; and, according as either prevails, affording different tinges of purple, approaching to violet, and sometimes fading to a pale rose colour. It is also found colourless, and may at any time be easily made so by putting it into the fire; in which state it so resembles the diamond, that its want of hardness seems the only way of distinguishing it. The notion that it prevented intoxication, however imaginary, prevailed to that degree among the ancients, that it was usual for great drinkers to wear it about their necks. The larger sorts were formed by the lapidary into cups, that were highly prized for the same supposed quality, which is made the subject of a smart epigram in the Anthology. The ancient artists also took this gem for the figure of Bacchus, to whom the stone was sacred, and for Bacchanalian subjects. It is found of various sizes, from the bigness of a small vetch to an inch and a half in diameter, and often to much more than that in length. Its shape is extremely various, sometimes roundish, sometimes oblong, and at others flatted, at least on one side; but its most common appearance is in a crystalli-form figure, consisting of a thick column composed of four planes, and terminated by a flat and short pyramid of the same number of sides; or else of a thinner and longer hexangular column; and sometimes of a long pyramid without any column. It appears most beautiful in the last of these states, but is hardest and most valuable in the roundish and pebble-like form. The amethyst is found in the East and West Indies, and in several parts of Europe. Mr. Morin showed Dr. Lister a large piece of French amethyst, which weighed between 200 and 300lbs! Mr. Ray speaks of a mountain of amethysts! The oriental amethysts, at least some of the finer specimens, are so hard and bright as to equal any of the coloured gems in value; but all the European ones, and not a few of those brought from the East and West Indies, are very little harder than common crystal.

De Boot (Hist. Gemmarum) mentions an amethyst, rendered colourless, estimated at 200 rix-dollars, which being cut to the same pattern, and set in a similar manner as a diamond of the value of 18,000 gold crowns, so nearly equalled it in lustre, that he could not tell the difference between them. Spars and crystals tinged red and yellow, &c. are sold for amethysts. The false ones come from Germany, are tinged by vapours in the mines, and contain some lead. Amethysts may be counterfeited by glass, to which the proper stain is given. There were fine ones made in France about the year 1690, which may even impose on connoisseurs, unless the stone be taken out of the collet.—The

method of giving this colour to glass is as follows: take ten pounds of clear glass or paste, made without manganese, and fuse it down with one ounce and a half of black manganese, and one drachm of zaffar. The process recommended by Porta is one drachm of manganese to one pound of frit.

AMETHYST, in heraldry, signifies the same colour in a nobleman's coat, that purpure does in a gentleman's.

AMETHYST, in medicine, a term used by some authors for an antidote against inebriety.

AMETHYSTEA, amethyst; in botany, a genus of the monogynia order, belonging to the diandria class of plants; in the natural method, ranking under the forty-second order, verticillatæ. The characters are: CAL. a single-leaved perianth. bell-shaped, angular, semiquinquefid, and persistent: COR. monopetalous; the border quinquepartite, the lowest division more expanding: STAM. two slender filaments approximated; the antheræ simple and roundish: PIST. a four-cleft germen; style, the size of the stamina: STIGM. two, acute: SEEDS four, gibbous, and shorter than the calyx.—There is only one known species, a native of Siberia, from whence the seeds were sent to the imperial garden at Petersburgh, and thence brought to Britain. It is an annual plant, with an upright stalk, which rises about a foot high. Towards the top it puts forth two or three small lateral branches, garnished with trifid leaves, sawed on their edges, of a very dark green colour.

AMETHYSTINA, in entomology, a species of chrysomela; above of a blue violet, and beneath of green and violet colour. Shells with scattered hollow dots. Thorax large, antennæ short and black. *Fabricius.*

AMETHYSTINUS, in conchology, a species of Venus, of an ovate shape and violet colour, with perpendicular striæ. It is about two inches in length and breadth.

AMETHYSTINUS, in entomology, an insect of the apis genus: nearly naked; black; wings violet: a native of the East Indies. Also a species of carabus that inhabits Cayenne; the wing-cases and abdomen blue; the head and thorax shining bronze. The antennæ hairy, ferruginous at the base; wing-cases streaked. *Fabricius.*

AMETHYSTINUS, in ornithology, a species of trochilus, or humming-bird, of Cayenne; its colours green gold, variegated beneath with gray and brown; throat amethystine blue; tail forked. *Gmelin.* Size of the red-throated hummingbird.

AMETHYSTIZONTES, in mineralogy, the best sort of carbuncle. *Plin.* l. 37. c. 9.

AMGAILA, or AMGAILAM, in ancient botany, a name given by Avicenna and others to a plant called acantha arabica, and amicantha by the Greeks. It is described as a prickly herb, with roots like those of the cypress, formed of several joints. It is also called sucaha and zucahai. The roots of this plant, called also bunkon, were much used by the Arabian physicians in stomachic and cardiac compositions. They were chosen by their lightness and smell.

AMHAK, or AMHARA, a province of Abyssinia, said formerly to extend forty leagues from east to west, and considered as the most important in the empire, both on account of its being the usual residence of the Abyssinian monarchs, and its dialect being the language of the court and of the higher classes. Here was the famed rock Amba-geshen, where the young princes were formerly confined. See AMBA-GESHEN. This name has been latterly given to a more limited province, lying immediately south of Lasta and Begemder, 120 miles in length and about forty in breadth. The district is mountainous; it contains a large portion of nobility, and the men are reckoned both the handsomest and bravest in Abyssinia. They boast that their troops are superior to double the number from any other province.

AMHERST (Jeffery), lord, descended from an ancient family at Sevenoaks in Kent, was born in 1717. In 1741 he was aid-du-camp to General Ligonier, at the battles of Dettingen, Fontenoy, and Rocoux. In 1756 he was appointed colonel of the fifteenth regiment of foot; and as major-general in 1758 he went to America and commanded at the siege of Louisbourg. The same year he was appointed commander-in-chief of all the forces in America, and governor of Virginia. On the accession of George III. he was made knight of the bath, and in 1763 returned to England. In 1771 he was appointed governor of Guernsey, and the year following lieutenant-general of the ordnance. In 1776 he was created Baron Amherst of Holmsdale, and in 1778 was commander-in-chief of the British army in England. In 1782 he received the gold stick from the king; but on the change of ministers his military appointments were transferred to other hands. He was again appointed to the command of the army of Great Britain in 1793, but in 1795 resigned, to make way for the Duke of York, when his lordship was made field-marshal. He died in 1798, and his remains were interred in Sevenoaks church. The character of lord Amherst will always stand high in the military history of England. Though a strict disciplinarian, he was the soldier's friend, and his private character was very respectable. He was twice married; but leaving no issue, the title devolved to his nephew.

AMHERST, one of the Magdalen Isles in the Gulf of St. Lawrence.

AMHERST, a county of Virginia, North America, between the Blue Ridge and the tide waters, on the north of James's River and containing 13,700 inhabitants, including 5300 slaves.

AMHERST, the shire town of Hilsborough county, New Hampshire, is a town of note, formerly Souhegan West, and originally granted from Massachusetts. It was incorporated in 1762; and in 1790 the Aurean academy was founded here. It stands on a northern branch of the Souhegan, sixty miles west of Portsmouth, and fifty-three north-west of Boston.

AMHERST, a township in Cumberland county, Nova Scotia, on Chignecto basin, on the south side of La Planch River. Also a township in Hampshire county, Massachusetts, containing 1233 inhabitants; ninety miles westerly from Boston, and about eight north-easterly from Northampton.

AMHERSTBURG, a town and fort of Upper Canada, on the east side of the river Detroit, at its entrance into lake Erie. Long. 82° 56′ W. lat. 42° 36′ N.

AMHURST (Nicholas), an English poet and political writer, was born at Marden in Kent, and entered of St. John's College, Oxford; whence he was expelled for irregularity. He was the author of Oculus Britanniæ, and a book entitled Terræ Filius, a Satire on the University; also of the Convocation, a poem in five cantos; but is best known by his contributions to the celebrated political paper called the Craftsman. He died neglected in 1742.

AMIA, in ichthythology, the name, 1. of a genus of abdominal fishes, of which there is but one known species, the amia calva of Carolina; 2. of a species called also glaucus, and by others leccia, which resembles a salmon, grows to a very large size, four or five feet long, and is common in the Mediterranean; 3. of a species of the SCOMBER, in the Linnæan system, which see.

AM'IABLE, AM'IABLY, AM'IABILITY, AM'IABLENESS, AM'ICABLE, AM'ICABLY, AM'ICABLENESS, *Amo*, to love,—*amabilis*. Amiable is Latin, and lovely Saxon for the same idea. As our Latin words are of later importation they mostly belong to the written or oratoric style, and are applied only in metaphor — Physical good we can call lovely; moral qualities we call *amiable*. Amicable, Lat. *amicus*, a friend, sometimes confounded with amiable, friendly, is Saxon, and amicable, Latin for the same idea.

For, as sayth Salomon, the *amiable-tonge* is the tree of lif; that is to say, of lif spirituel.

Chaucer. The Personnes Tale.

The shepeherdes, by reason of the vnwovnt and sodain miracle, wer all at ons throughly taken with a verai great feare. But the aungell anon taketh awai this feare with speaking *amiably* vnto them.

Udall. Luke, cap. ii.

Even those who break the peace cannot but praise it: how much more should they bid for it, that are true friends to it; and to that *amicableness* that attends it. *Bp. Hall's Peace-Maker.*

Now, for whatsoever we can love any one, for that we can be his friend; and since every excellency is a degree of *amiability*, every such worthiness is a just and proper motive of friendship or loving conversation. *Bp. Taylor on Friendship.*

That which is good in the actions of men, doth not only delight as profitable, but as *amiable* also.

Hooker.

She told her, while she kept it,
'Twould make her *amiable*, subdue my father
Entirely to her love; but if she lost it,
Or made a gift of it, my father's eye
Should hold her loathed. *Shakesp. Othello.*

I found the king abandon'd to neglect,
Seen without awe, and serv'd without respect.
I found my subjects *amicably* join
To lessen their defects by citing mine.
The priest with pity pray'd for David's race,
And left his text, to dwell on my disgrace.

Prior's Solomon, b. iii.

LYNDAR. That friendship, which from wither'd love does shoot,
Like the faint herbage on a rock, wants root;
Love is a tender *amity*, refin'd:
Grafted on friendship it exalts the kind.
But when the graft no longer does remain,
The dull stock lives; but never bears again.

Dryden's Conquest of Granada, part 2d.

Then drest by thee more *amiably* fair,
Truth the soft robe of mild persuasion wears;
Thou to assenting reason giv'st again
Her own enlighten'd thoughts.

Thomson's Winter.

AMIANTHUS, EARTH-FLAX, or SALAMANDER'S HAIR, in natural history, a fibrous, flexible, elastic, mineral substance, consisting of short abrupt and interwoven filaments. It is found in Germany, in the strata of iron ore, sometimes forming veins of an inch diameter. Its fibres are so flexible that cloth has been made of them, and the shorter filaments that separate in the washing of the stone, may be made into a paper in the common manner. For the method of its preparation for manufacture into cloth, see ASBESTOS. Amianthus is classed by Kirwan in the muriatic genus of earths, because it contains about a fifth part of magnesia. Its other constituents are flint, mild calcareous earth, barytes, clay, and a very small portion of iron. It is fusible per se in a strong heat, and also with the common fluxes. It differs from asbestos in containing some ponderous earth. There are four species of this genus, two of which are composed of large, and two of small filaments. Dr. Chalmers observes, that 'it has been a common error to confound the different species of this genus with one another, and all of them with the several species of the asbestos; in consequence of which the art of spinning and working the asbestos into incombustible cloth has been lost,' or at least neglected. It is not soluble by acids, and it is said to resist poison and cure the itch. See ASBESTOS.

AMICABLE BENCHES, scamna amicabilia, in Roman antiquity, were, according to Pitiscus, lower and less honourable seats allotted for the judices pedanei, or inferior judges, who, upon being admitted of the emperor's council, were dignified by him with the title amici.

AMICABLE NUMBERS, such as are mutually equal to the sum of one another's aliquot parts. Thus the numbers 284 and 220 are amicable numbers: for the aliquot parts 1, 2, 4, 5, 10, 11, 20, 22, 44, 55, 110, of 220, are together equal to the other number 284; and the aliquot parts 1, 2, 4, 71, 142, of 284, are together equal to 220. From the number 2 itself, the first or least pair of amicable numbers is thus derived:—1, subtracted from three times this sum, gives the number 5; from six times this sum 11; from eighteen times its square 71, multiplying which by 4, the double of the assumed number, we have 284 for one of the amicable numbers, the sum of whose aliquot parts is 220, the other. 18,416 and 17,296; 9,437,056 and 9,363,584 are two other pairs of amicable numbers.

Some properties of amicable numbers of the Cartesian form, have been investigated by Mr. Gough, (Leybourne's Month. Repos. No. 7.) $a\,x$ and $a\,y\,z$ are amicable numbers of a common measure, a, multiplied by the primes x, y, and z. Dividing a pair of amicable numbers, according to this author, by their greatest common measure, and increasing the prime divisors of these quotients by unity, the products of the two sets

thus augmented, will be equal. Put $q =$ the sum of the divisors of a, then if a be given q is given; but q must be less than a; and if two sets of primes, d, x, and r, y, z, can be found, which will make $(1 \times d)\ (1 \times x) = (1 \times r)\ (1 \times y)(1 \times z)$, &c.; and also give the following proportion, as $a : q :: (1 \times d)\ (1 \times x) : r, y, z$,—$(1 \times d \times x)$ then will $a\ d\ x$, $a\ r\ y\ z$, be amicable numbers. In the amicable numbers of Descartes, no two of the primes x, y, and z, can be equal; nor can any of them be $= 2$; nor can a be a prime: q must be less than a, yet greater than $\frac{1}{2}\ a$, and must be a power of 2. If the primes x, y, z, be given, making $x \times 1 = (y \times 1)\ (z \times 1)$, to find if they can constitute amicable numbers: divide $z \times 1$ by $y \times 1$, and call the quotient p; then if p be not 2, nor a power of 2, the thing is impossible; but if p be the same power as 2, divide $y \times 1$, by $p \times 1$, and put the quotient $= f$; then if f be neither 2, nor a power of 2, the thing is impossible; but if $f = 2\ n$, the common multiplier $a = 2\ f$.

AMICABLE SOCIETY. See ASSURANCE.

AMICE, } *Amicio, amictus*, to clothe. Ap-
AMYTTE. } plied to the first of the six vestments common to the bishop and presbyters, which was fastened round the neck and spread round the shoulders.

Men knowing ye worde of God thinke also that this costly gray *amices* of calaber are very superfluous and vayn. *Bale's Images of both Churches*, p. 14.

[In the ceremonies of the mass.] The *amice* on the head is the kercheue that Christ was blyndfolded with when the souldiors buffeted him, and mocked him saying; prophecie vnto vs who smote thee! *The whole workes of Wm. Tyndall, &c.* f. 277, c. ii.

Thus passed the night so foul, till morning fair
Came forth, with pilgrim steps, in *amice* gray;
Who with her radiant finger still'd the roar
Of thunder, chas'd the clouds, and laid the winds.
Milton's Par. Reg. b. iv.

How quick ambition hastes to ridicule!
The sire is made a peer, the son a fool.
On some, a priest, succinct in *amice* white,
Attends; all flesh is nothing in his sight.
Pope's Dunciad.

AMICITIA, Lat. friendship, in law, is applied to a tenure of land, styled a tenure in amicitia, when granted freely and of mere good will, to be enjoyed at the discretion of the donor.

AMICO (Bernardino), an Italian artist of Gallipoli, in the kingdom of Naples, who becoming prior of a convent at Jerusalem, made drawings of the holy city and its suburbs. On his return to Italy he published a splendid folio, entitled Trattato delle Piante è Imagini de' Sacri edifizi di Terra Santa. Rome, 1620, folio: now a scarce and valuable work. Plates were engraved from his designs by Callot.

AMICONI (Giacomo), an historical and portrait painter of Venice, who came to England in 1729, and painted many fine pieces for the principal nobility. He afterwards went to Spain, where he received the appointment of portrait painter to the king, and died there in 1752. Lord Orford condemns his taste.

AMICTUS, in Roman antiquity, was any upper garment worn over the tunica.

AMICU, a lake of South America, in the province of Cumana, whose waters run southwardly through the Parima river into the Amazons.

AMICULATUS, in conchology, a species of chiton, having shells of eight valves, kidney-shaped, and very brittle; the external covering is a scabrous coriaceous membrane; length, six inches. It inhabits the Kurile islands.

AMICULUM, in Roman antiquity, a woman's upper garment, which differed from the pala. It was worn both by matrons and courtesans.

AMICUS CURIÆ, i. e. the friend of the court, a law term, for a bystander who informs the court of a matter in law that is doubtful or mistaken.

AMID, } Ang. Sax. *On-middan, on-middes.*
AMIDST. } Chaucer *amiddes, in medio*, in the mid or middle.

The riche Cresus whilom king of Lide,
Of whiche Cresus, Cirus sore him dradde,
Yet was he caught *amiddes* all his pride,
And to be brent men to the fire him ladde.
Chaucer. Monkes Tale.

Amid the bowels of the earth full steep,
And low, where dawning day doth never peep,
His dwelling is. *Spenser.*

The boar *amidst* my crystal streams I bring,
And southern winds to blast my flow'ry spring.
Dryden.

Amata's breast the fury thus invades,
And fires with rage *amid* the sylvan shades.
Dryden.

What tho' no real voice nor sound
Amid their radiant orbs be found?
In reason's ear they all rejoice,
And utter forth a glorious voice,
For ever singing, as they shine,
'The hand that made us is divine.'
Addison.

Of the fruit
Of each tree in the garden we may eat;
But of the fruit of this fair tree *amidst*
The garden, God hath said, Ye shall not eat.
Milton.

Lo! where the stripling, wrapt in wonder roves
Beneath the precipice o'erhung with pine;
And sees, on high, *amidst* th' encircling groves,
From cliff to cliff the foaming torrents shine:
While waters, woods, and winds, in concert join,
And echo swells the chorus to the skies.
Beattie's Minstrel

AMID AMID, a ridge of Abyssinian mountains, supposed to have formed part of the Montes Lunæ of the ancients. It is the centre of a triple ridge, composed of the Aformasha, Amid Amid, and Litchambara mountains, rising in the form of three concentric circles, the Amid Amid being of an elevation of about half a mile. The whole are covered with beautiful pasturage, and the inhabitants are said by Bruce to have preferred to cultivate the tops, as rendering them more secure from their hostile neighbours. Villages are scattered over them, according to this writer, built of a white kind of grass, which makes them very conspicuous at a distance.

AMIDA, an idol of the Japanese, who has many temples erected to him, of which the principal is at Jedo. The Japanese have such a confidence

in this deity that they hope to attain eternal felicity by the frequent invocation of his name.

AMIDA, or AMMOENA, in ancient geography, called also Constantia in honour of Constantius, a principal city of Mesopotamia, situated on a high mountain, on the borders of Assyria, on the Tigris, where it receives the Nymphius. It was taken from the Romans, in the time of the emperor Constans, by Sapores king of Persia. The siege is said to have cost him 30,000 men; however, he reduced it to such ruin, that the emperor afterwards wept over it. According to Ammianus Marcellinus, the city was rased; the chief officers were crucified; and the rest, with the soldiers and inhabitants, either put to the sword or carried into captivity, except our historian himself, and two or three more, who, in the dead of the night, escaped through a postern, unperceived by the enemy. In A. D. 501, it again sustained a dreadful siege by the Persians, but was restored shortly after to the empire; it relapsed again to the Persians on the decline of the Roman power, and finally fell to the Saracens and Turks, the latter of whom call it Diarbekir and Kara-amid.

AMIDANO (Pomponio), a painter of Parma, in 1600, who is supposed to have studied under Parmegiano. He painted historical subjects in a fine style, and the heads of his figures exhibit considerable taste and grandeur.

AMID-SHIPS, a sea term denoting the middle of the ship, either as to length or breadth.

AMIENNOIS, a ci-devant county of France, containing great part of the country anciently inhabited by the Ambriani. See next article.

AMIENS, a populous town of France, in the department of Somme, situated on the road from Calais to Paris, ten leagues south-east of Abbeville, and 139 south west of Aras. It stands on the river Somme, and is said to have received its Latin name Ambianum, from being everywhere encompassed with water. Amiens is a place of great antiquity; being mentioned by Cæsar as a town that had made a vigorous resistance against the Romans, and where he convened a general assembly of the Gauls, after having made himself master of it. The emperors Antoninus and Marcus Aurelianus enlarged it; and Constantine, Constans, Julian, and several others, resided here. It was prior to the revolution the see of a bishop, and the chief town of the Amiennois, as well as of the whole of Picardy. It is now the capital of the department of the Somme, which is navigable to the town, and contains a population of about 40,000 inhabitants. It is a pleasant well-built place, having several regular squares, a strong citadel, a cathedral, and other public buildings. A considerable trade in serge and other woollen stuffs, manufactured in the neighbourhood, is carried on by the inhabitants. Here also are manufacturers of ribbons, linen, green soap, &c.; so that, in a commercial point of view, Amiens has long held a distinguished rank in the trading towns of Europe; nor is it destitute of interest in the annals of history. It was taken by the Spaniards in 1597 by the following stratagem: Soldiers, disguised like peasants, conducted a cart laden with nuts, and let a bag of them fall just as the gate was opened. While the guard was busy in gathering up the nuts, the Spaniards entered and became masters of the town. It was taken by Henry IV. who built a citadel in it. The definitive treaty of peace between the different European powers, in 1802, was negociated here. The Amiennois is a fertile district, once a generalité, and comprising the greater part of Picardy Proper, the Boulonnois, and Calaisis. It was originally a county under the bishop of Amiens, by grant from the king; it then passed through private hands into the family of the count of Flanders, who undertook a war for its defence against the French crown. Charles VII. granted it to Philip of Burgundy, but Louis XI. again annexed it to France, and since 1585, when Charles V. formally renounced all title to this district, it has remained in the possession of that power. M. Neckar calculated its area at 458 square leagues; its revenue at 15,200,000 livres, and population at 533,000.

AMIENS, or AMIENT, a Roman gold coin, worth seventeen shillings and one penny farthing.

AMILCAR, or HAMILCAR, the name of several Carthaginian captains. The most celebrated of them is Amilcar Barcas, the father of Hannibal, who during five years infested the coast of Italy; when the Romans sending out their whole naval strength, defeated him near Trapani, 242 years before Christ; and this put an end to the first Punic war. Amilcar began the second, and landed in Spain, where he subdued the most warlike nations; but as he was preparing for an expedition against Italy, he was killed in battle, U. C. 526, A. A. C. 228. He left three sons, whom he had educated, as he said, like three lions, to tear Rome in pieces; and made Hannibal, his eldest son, swear an eternal enmity against the Romans.

AMILJA, one of the Aleutian islands, about forty-four miles in length from east to west. It is narrow, naked, and mountainous, particularly in the centre; and is thinly inhabited.

AMILICTI, in the Chaldaic theology, a kind of intellectual powers, or persons in the divine hierarchy. They are represented as three in number; and constitute one of the triads, in the third order of the hierarchy.

AMINADAB, or AMMINADAB, the son of Aram, great grandson of Judah, and the father of Naashon, one of the progenitors of the royal house of David. He was also the father of Elishema, the wife of Aaron, and thus the progenitor in the maternal line of the high priests, as well as of the kings of Judea, in the paternal.

AMINEUM ACETUM, a name used by some medical writers for white wine vinegar, to distinguish it from other kinds.

AMINEUM VINUM, Aminean wine, highly esteemed by the ancients for imbecilities in the stomach. Macrobius thinks it the same with the Falernian wine; but Virgil (Georg. l. 2, v. 96.) distinguishes them.

AMINIAS, the brother of Æschylus the poet, and the saviour of his life when condemned for blasphemy. See ÆSCHYLUS.

AMIOT (Father), a Chinese missionary from

France, was born at Toulon in 1718, and died in 1794, aged 77. He arrived at Macao in 1750, was invited to Pekin in 1751 by the emperor of China, and remained in that capital forty-three years. By continued application he soon became acquainted with the Chinese and Tartar languages, and sent from time to time the result of his attainments and collections to France. His works are, a Chinese Poem in praise of the city of Moukden, by the emperor Kien Long, translated into French, 8vo. Paris, 1770. The Chinese Military Art, 4to. Paris, 1772. Letters on the Chinese Characters. On the Music of the Chinese. The Life of Confucius. Dictionnaire Tartar Mantcheou François, 3 vols 4to. Paris, 1789.

AMIRANTE ISLANDS, a small group of isles in the Indian Ocean, lying to the south-west of the Seychelles, and about thirteen degrees to the north of Madagascar. They possess very little either of culture or population.

AMIRANTE, in the Spanish polity, a great officer of state, answering to our lord high-admiral.

AMISS', *n.* & *adv.* Ang. Sax. *missian*, to err; Dutch *missen*, to err; German *missen*, to want. Miss, as well as *amiss*, is found in Chaucer. Error, fault, deceitfulness, deficiency.

Aftur fyftene dawes, þat he hadde ẏ ordeyned þis
To London he wende, for to amend þat þer was
amys. *R. Gloucester*, p. 144.

'O deuel,' said þe kyng, 'þis is a foltid man,
'Whan he with trechettyng bi nyght away so ran.
'þei red him alle *a mysse*, þat conseil gaf þerte.'
'Wenes he our men Inglisse for to trecther so?'
R. Brunne, p. 164.

Every people, nation, and language, which speak any thing *amiss* against the God of Shadrach, Meshach, and Abednego, shall be cut in pieces, and their houses shall be made a dunghill; because there is no other God that can deliver after this sort.
Daniel, iii. 29.

We hope therefore to reform ourselves, if at any time we have done *amiss*, is not to sever ourselves from the church we were of before. *Hooker.*

O ye powers that search
The heart of man, and weigh his inmost thoughts,
If I have done *amiss*, impute it not! *Addison.*

Your kindred is not much *amiss*, 'tis true;
Yet I am somewhat better born than you. *Dryden.*

I built a wall, and when the masons played the knaves, nothing delighted me so much as to stand by, while my servants threw down what was *amiss*. *Swift.*

AMISUS, the chief city of the ancient kingdom of Pontus, built by the Milesians, and peopled partly by them, and partly by a colony from Athens. It was at first a free city, like the other Greek cities in Asia; but afterwards subdued by Pharnaces king of Pontus, who made it his metropolis. It was taken by Lucullus at Eupatoria a neighbouring city, in the Mithridatic war. Several medals of Adrian, Sabina, Ælius Cæsar, Antoninus Pius, &c. were struck here. Some of the inscriptions show its alliance with the town of Amastris, as does a medal of which the annexed is a diagram, representing two Amazons standing by an altar with their right hands joined, one bearing an axe, and the other a spear; to denote

that these two towns, which deduced their origin from the two Amazons, Amisus and Amastrus, entered into alliance with each other.

AMIT', } *A, mitto*, to let out, let go. To
AMIS'SION, } send away, to lose. Obsolete.

But ice is water congealed by frigidity of the air whereby it acquireth no new form, but rather a consistence or determination of its diffluency, and *amitteth* not its essence, but condition of fluidity.
Brown's Vulgar Errours.

If any shall further queery why magneticall philosophy excludeth decussations, and needles transversly placed do naturally distract their verticities? why geomancers do imitate the quintuple figure in their mother's characters of acquisition and *amission*, &c. * *

He shall not fall on trite or trivial disquisitions.
Brown's Garden of Cyrus.

AMITERNUM, a town of the Sabines, in Italy, now extinct. The ruins are to be seen on the level ridge of a mountain, near S. Vittorino, not far from Aquila, which rose out of the ruins of Amiternum.

AMITTERE LEGEM TERRÆ, among lawyers, a disablity to appear as witness in any court. Such was the punishment of a champion overcome or yielding in battle, of jurors found guilty in a writ of attaint, of a person outlawed, &c.

AM'ITY. Fr. *amitié*; from *amo*. Friendly intercourse between nations; opposed to a state of warfare: denoting also agreement, and absence of discord among lesser bodies of people, and friendship between individuals.

For excellent and wonderful art thou (O Lord) and thy face is full of *amyte*.
Bible, 1539, *Ester*. ch. xv.

Debateful strife, and cruell enmity,
The famous name of knighthood fowly shend;
But lovely peace, and gentle *amity*,
And in amours the passing howres to spend,
The mightie martiall handes doe most commende.
Spenser's Faerie Queene, b. ii. c. 6.

LAF. I have then sinned against his experience, and transgressed against his valour, and my state that way is dangerous, since I cannot yet find in my heart to repent. Here he comes, I pray you make us friends, I will pursue the *amity*.
Shakspeare's All's Well that ends Well.

Nothing is so strong a tie of *amity* between nation and nation as correspondence in laws, customs, manners, and habits of life. *Burke.*

AM-KAS, in history, a spacious saloon in the palace of the Great Mogul, where he gave audience to his subjects, and appeared on solemn festivals with extraordinary magnificence.

AMLI, one of the Aleutian islands in the North Pacific Ocean, forty-four miles in length.

AMLIAK, another of the Aleutian islands. Long. 187° 14′ E., lat. 53° 30′ N.

AMLWCH, a town of North Wales, on the north side of the isle of Anglesey, eighteen miles from Holyhead, and 261 north-west of London. Since the discovery of copper mines in this neighbourhood, the town of Amlwch, or Anlwick has risen into considerable importance. The harbour was made at the expense of the Parys Mine Company, and cut out of the solid rock. It is capable of admitting thirty vessels of two hundred tons burden each. The mines are about two miles from the town. Here is an elegant modern church, consecrated by the

late bishop of Bangor in 1801, and said to have been erected at the expense of £4,000, the whole of which was defrayed by the Mine Company. Population 4629. It has an annual fair on the 12th of November.

AMMA, among ecclesiastical writers, a term used to denote an abbess or spiritual mother.

AMMA, in authors of the middle age, a spiritual mother; an abbess or superior of a nunnery.

AMMAILARE, in old records, to enamel.

AMMAN (John Conrad), a native of Schaffhausen, was born in 1669, and distinguished himself by his success in teaching the deaf and dumb to speak. He published Surdus Loquens, 8vo. Haerlem, 1692, and De Loquela, 12mo. Amsterdam, 1700: also an edition of Cœlius Aurelianus, in quarto 1709; and died in 1724 at Marmund in the Netherlands.

AMMAN (John), son of the above, was fellow of the Royal Society in London, and member of the Academy of Sciences at Petersburgh. He published Stirpium rariorum in imperio Rutheno Sponte Provenientium icones et Descriptiones, in 4to. and died in 1740.

AMMAN (Paul), was a native of Breslaw, who settled in 1674 at Leipsic, where he gave lectures on physiology, history, and botany. He is the author of Character naturalis Plantarum. Irenicum Numæ Pompilii cum Hippocrate, 8vo. Paranesis ad discentes occupata circa Institutionum Medicarum emendationem, in duodecimo. Archeas Syncopticus, Eccardi Leichneri. And died in 1691.

AMMANIA, in botany, a genus of plants of the monogynia order, belonging to the tetandria class, in the natural method ranking under the seventeenth order, Calycanthemæ. The characters are: CAL. an oblong, erect, bell-shaped perianthium, with eight striæ, quadrangulated, octodented, and persistent: COR. is either wanting or consists of four ovate expanding petals inserted in the calyx: STAM. four bristly filaments the length of the calyx; the antheræ are didymous: PIST. a large ovate germen, above; the stylus simple and very short; the stigma headed: PER. a roundish four-celled capsule, covered by the calyx: the seeds are numerous and small. Of this genus there are three species enumerated; all of them natives of warm climates.

AMMER, in geography, a powerful but infamous tribe of Arabs, who, according to Dr. Shaw, inhabit the province of Constantina, in Africa; and, contrary to the practice of their brethren, prostitute their wives and daughters. Also a range of mountains in the above neighbourhood.

AMMER, a small lake of Bavaria, near the foot of the Alps, about half way between the Iser and the Lech.

AMMERLAND, a market town with two castles in Upper Bavaria, circle of the Iser, district of Wolfrathshausen, near the lake of Wurm.

AMMERPOOR, or ANEAPURAS, a town of Hindostan, on the north-west of the Bagmutty river, in the district of Mocwanpoor, ten miles east of the last place, and in N. lat. 27° 31′, E. long. 82° 26′.

AMMERSEE, a lake of Upper Bavaria, in the circle of the Iser. It is nine miles long, four and a half broad, and very abundant in fish.

AMMI, BISHOP'S WEED, in botany, a genus of the digynia order, belonging to the pentandria class of plants; and ranking in the natural method under the forty-fifth order, umbellatæ. The characters are: CAL. the universal umbel manifold; the partial one short and crowded; the involucra pinnatifid, with numerous leaflets: COR. radiated, and all hermaphrodite: STAM. five capillary filaments; the antheræ roundish: PIST. a germen beneath: the STYLI two and reflected; and the stigmata obtuse. There is no pericarpium; the fruit roundish, polished, striated, small and partible. The seeds are two, plane-convex, and striated. Of this there are three species: 1. A. Copticum, or Egyptian bishop's weed, now no otherwise known than by the figure of its seeds, which were formerly used in medicine. 2. A. glaucifolium, with all its leaves cut in the form of a spear, is perennial, and very hardy. 3. A. majus, or common bishop's weed, the seeds of which are used in medicine, an annual plant.

AMMI is also a name of the sison ammi, the cicuta bulfera, the seseli ammoides, and sium falcaria of Linnæus.

AMMIANUS (Marcellinus), a Grecian and a soldier, as he calls himself, was born at Antioch, and flourished under Constantius and the succeeding emperors, as late as Theodosius. He served under Julian in the east; and wrote in Latin an interesting history, from the reign of Nerva to the death of Valens, in thirty-one books; of which only eighteen remain. Though a pagan, he speaks with candour and moderation of the Christian religion, and even praises it: his hero is the emperor Julian. He died about A. D. 390. The best edition of his history is that of Gronovius, in 1693.

AMMINEA UVA, in botany, the grapes of a wild vine, common in the hedges of Italy, and other places.

AMMION, in chemistry, cinnabaris.

AMMIRATO (Scipio), an eminent Italian historian, born at Lecce in Naples, in 1531. After travelling over a great part of Italy, he was engaged by the grand duke of Tuscany, to write the history of Florence: for which he was presented to a canonry in the cathedral there. His works while in this station are, 1. Arguments, in Italian verse, 4to. Venice, 1548. 2. Il Decalione Dialogo del Poeta, 8vo. Naples, 1560. 3. Istorie Fiorentine, dopo la Fondatione di Fierenze insino all, anno 1574. He died in 1601.

AMMITES, in mineralogy, a kind of figured stone of a loose open contexture, formed of a number of small globular stones. It is found in different parts of Germany, of various colours and degrees of hardness. It is by some reckoned the same with the ammodytes.

AMMOCŒTUS, in ichthyology, the sand-eel. See AMMODYTES.

AMMOCHOSIA, from αμμος, sand, and χεω, to lie along, a remedy prescribed by ancient physicians, which consisted in laying the patient on warm sand, and covering him with it.

AMMOCHRYSOS, from αμμος, sand, and

χρυσος. gold, a stone very common in Germany, and seeming to be composed of a golden sand. It is of a yellow gold-like colour, and its particles are very glossy, being all fragments of a coloured talc. It is usually so soft as to be easily rubbed to a powder in the hand; but sometimes requires grinding to powder in a mortar, or otherwise. It is used as sand to strew over writing. There is another kind of it less common, but much more beautiful, consisting of the same sort of glossy spangles, not of a gold colour, but a bright red, like vermilion.

AMMOCHYSUS, in natural history, a kind of gem supposed to be the same with the avanturine.

AMMODYTES, from αμμος, sand, and δυτης, a diver: sand eel, in ichthyology, a genus of fishes, belonging to the order of apodes. This fish resembles an eel, and seldom exceeds a foot in length. The head is compressed, and narrower than the body; the upper jaw larger than the under; the body cylindrical, with scales hardly perceptible. There is but one species, viz.: Ammodytes tobianus, or the launce, a native of Europe.

AMMODYTES, in zoology, a species of serpent, by some called serpens cornutus, from a protuberance on its head. It is yellow or sand coloured, and about the size of a viper; its jaws are wide, and the upper part of the head has a wart-like excrescence, resembling a horn. It is principally found in Lybia and some parts of Illyria.

AMMOIDES, in botany, the name given by Boerhaave, to the bishop's weed. See AMMI.

AMMON, an ancient city of Marmarica, in which stood the temple of Jupiter Ammon, round which there was nothing but sandy wastes. Pliny says, that the oracle of Ammon was twelve days' journey from Memphis, and among the Nomi of Egypt he reckons the Nomos Ammoniacus: Diodorus Siculus, says, the district where the temple stood, though surrounded with desarts, was watered by dews which fell nowhere else in all that country. It was agreeably adorned with fruitful trees and springs, and full of villages. In the middle stood the acropolis or citadel, encompassed with a triple wall; the first and inmost of which contained the palace; the others the apartments of the women, the relations and children, as also the temple of the god, and the sacred fountain. Without the acropolis, at no great distance, was another temple of Ammon, shaded by a number of tall trees; near which there was a fountain, called Solis Fons, or the fountain of the sun, because subject to extraordinary changes according to the time of the day; being at morning and evening warm, at noon cold, and at midnight extremely hot. A kind of fossil salt was said to be naturally produced here. It was dug out of the earth in large oblong pieces, sometimes three fingers in length, and transparent as crystal. It was thought a present worthy of kings, and used by the Egyptians in their sacrifices. From this our sal ammoniac has taken its name.

AMMON, עמון, Heb. i. e. the son of my people, or Ben-Ammi, the son of Lot, by his youngest daughter. He was the father of the Ammonites, and dwelt to the east of the Dead Sea, in the mountains of Gilead. See AMMONITES.

AMMON, or HAMMON, in heathen mythology, the name of the Egyptian Jupiter, worshipped under the figure of a ram. The fable is, that Bacchus having subdued Asia, and passing with his army through the desarts of Africa, was in great want of water: but Jupiter his father, assuming the shape of a ram, led him to a fountain, where he refreshed himself and his army; in gratitude for which Bacchus built there a temple to Jupiter, under the title of Ammon, from the Greek αμμος; and alluding to the sandy desart where it was built.

AMMONIA. This name has been given to a material which has actually been classed among the alkalies, in consequence of the properties it possesses, in common with these last, of uniting with acids to form neutral compounds, of converting vegetable blues to green, and yellows to red: it is moreover attracted to the negative pole of a voltaic battery as are the other alkalies; and hence its alkaline nature being considered as demonstrated, it has been termed volatile alkali, this last name and ammonia being employed as synonymous.

This material (ammonia) when pure exists in a gaseous condition, and it does not become liquid, according to Guyton, till the temperature to which it is exposed be reduced to 56° of Fahrenheit; and even then its liquefaction is attributable, according to the opinion of other chemists, to the hygrometric vapour it contains, and from which the pure gas is separated with extreme difficulty. The specific gravity of ammonia, at 60° Fahrenheit, is stated to be 0,000,715, being to that of atmospheric air as 590 to 1000; 100 cubic inches of it weigh, according to Kirwan 18.2; according to Davy 18.4; and according to Biot, and Arago 19.6 grains. Its smell is extremely pungent; it inflames the skin, and animals are immediately killed by immersion in it.

Its constituents are hydrogen and nitrogen, the former principle being in very large proportion to the latter; it appears probable (says Mr. Brande), that one volume of ammonia is resolved by electric decomposition into two volumes of a mixture of hydrogen and nitrogen, consisting of three volumes of hydrogen and one volume of nitrogen; and Dr. Prout, in the 38th number of the Annals of Philosophy, gives the theoretical proportions of three atoms of hydrogen + one azote (nitrogen). Its composition, however, was not discovered by its synthetic formation; for when hydrogen and nitrogen are mixed together in a gaseous state, the elasticity of each gas is an obstacle to their mutual affinity; nor can their combination be effected, as is the case with some other mixed gases, by transmitting the electric spark through the mixture, or exposing them to a high temperature.

It may be, and very generally is, obtained by heating a mixture of quick-lime and sal ammoniac (muriate of ammonia). Two parts of the former, and one of the latter are to be introduced into a small glass retort; and upon the application to this mixture of a gentle heat, the gas passes over, which must be collected over mer-

cury. It is also produced by more indirect processes, as from the decomposition of animal matter by heat. Bones exposed to a high temperature give out ammonia, from the combination of portions of the hydrogen and nitrogen of the animal matter contained in them. Other animal substances in decomposition form also ammonia; as do, indeed, some varieties of vegetable matter. Coal soot, for instance, which is of vegetable origin, yields it in combination with some of the acids. But when the material in question is obtained by these processes, it is mixed with an empyreumatic oil, which gives it a fœtid odour; thus, what is usually called the spirit of hartshorn, from its having been obtained in abundance from the horns of the hart, is only different from liquid ammonia by the latter being without and the former combined with this empyreumatic oil. See AMMONIAC SAL (Sal Ammoniac, or muriate of Ammonia).

Ammonia is inflammable, and by this property is it said to be distinguished from all other substances possessed of alkaline properties. When a kindled match is immersed in it, the flame, before it is extinguished, is enlarged, and is of a pale yellow colour at the edges; if mixed previously with two-thirds of atmospheric air it kindles, and gives a white lambent flame. It detonates with oxygen gas; this detonation is effected only when the two gases are in a certain proportion. With a greater proportion of oxygen gas to ammonia than that of three to one, or of ammonia to oxygen than that of three to 1.4, the mixture does not inflame. But within these limits it is inflamed readily by the electric spark. The results are different according to the proportion. If the volume of oxygen gas be double that of the ammonia, the latter is entirely consumed; its hydrogen combines with the requisite quantity of oxygen, forming water, and its nitrogen partly remains with any redundant oxygen, and is partly combined with a portion of oxygen forming nitric acid, which uniting with ammonia forms a dense vapour. If the ammonia exceeds considerably the oxygen, no nitric acid is formed; if the proportion of oxygen is that which is just necessary to saturate the hydrogen, nitrogen remains: but if the proportion be even lower than this, still the whole of the ammonia is decomposed; part of its hydrogen combines with the oxygen, and the remaining hydrogen, with the nitrogen, form a mixture which, on the addition of a fresh quantity of oxygen, may be inflamed by the electric spark. No mixture of ammonia, in any proportion, with atmospheric air can be inflamed by the electric spark; but the mixture of it with oxygen, even when diluted with six times its bulk of atmospheric air, burns. Ammonia introduced from a small aperture in a tube into oxygen gas suffers slow combustion, burning with a pale yellow flame. Nitrous oxide, and nitric oxide gases form mixtures with ammonia which are capable of being inflamed. *Murray.*

Although, as we have said, ammonia, when pure, exists naturally in a gaseous condition, it must be observed that water, at the temperature of 50°, takes up 670 times the volume of the material; and the usual state in which it is employed, as well in chemistry as in medicine, is in solution; this solution in the London Pharmacopœia bears the name of liquor ammoniæ, and may be obtained by passing the gas into water in a proper apparatus, or by distilling over the water and gas together.

Mr. R. Phillips, in his remarks on the London Pharmacopœia, recommends the following process for obtaining this liquid ammonia, which Mr. Brande, in his valuable work entitled A Manual of Chemistry, quotes and approves. On nine ounces of well-burned lime pour half a pint of water; and, when it has remained in a well-closed vessel for about an hour, add twelve ounces of muriate of ammonia in powder, and three pints and a half of boiling water; when the mixture has cooled, pour off the clear portion, and distil, from a retort, twenty fluid ounces. The specific gravity of this solution, which is sufficiently strong for most purposes, is 0.954. It should be preserved in well-stopped glass bottles, since it loses ammonia when exposed to the air, and absorbs carbonic acid.

The first clue to the discovery of the properties by which ammonia is characterised, was given by Dr. Priestley. He first produced an alkaline air by a mixture of lime and sal ammoniac, which was absorbed by water, forming 'volatile spirit of sal ammoniac, much stronger than that produced by other means;' he observed, also, that on taking the electric spark or explosion in this air over quicksilver, its volume is enlarged, until it occupies three times its original space; and that its properties also, as well as its volume, are changed, no longer being absorbed by water, and becoming moreover inflammable. Dr. Priestley afterwards found, that by heating certain metallic oxides in this air, they were reduced to the metallic state, water being developed, and the residual air being apparently nitrogen gas.

The theory (says Murray) of these experiments, is now sufficiently evident. By the action of the electric spark, or of a red heat, the gas is resolved into its constituent elements, hydrogen and nitrogen; hence the enlargement of volume and change of properties. The reduction of the metallic oxides is owing to the oxygen of the oxide combining with the hydrogen of the ammonia, and forming a small portion of water, the metal of course appearing in its metallic state; while the nitrogen, the other component principle of the alkali, being freed from its state of combination, assumes the gaseous form.

After the splendid discoveries respecting the composition of alkalies (see ALKALI), it was conceived that ammonia would prove to contain oxygen; but hitherto experiment has failed in showing this to be the case, although weight has been supposed due to the inference from analogy: and on this supposition, says a modern chemist, it must be inferred that either hydrogen or nitrogen must be a compound, and contain oxygen as a constituent element. Assuming, likewise, from analogy the metallic base of ammonia, and proceeding on the principle of Richter, that all metallic bases saturating the same quantity of an acid must contain the same portion of oxygen combined with them; the

proportion of oxygen in ammonia must be 47 in 100 parts, according to Berzelius, who considers the nitrogen as the furnisher of it. Berzelius adds some other arguments of an analogical nature to strengthen the inference of oxygen being contained in ammonia; which has also been supposed, from analogy with the other alkalies, to have a metallic base; but we want experiments from which to predicate either that oxygen is a constituent of this substance, or that it contains metallic matter; although the ammoniacal hydrurets of mercury and potassium, obtained by subjecting quicksilver and potassium mixed with liquid ammonia to voltaic agency, present results which are exceedingly interesting in reference to the analogy between ammonia and other alkalies.

In the article chemistry, and in alphabetical order, we shall treat of the several substances which enter into combination with ammonia to form distinct compounds; but we deem it expedient to attach to this paper a particular account of sal ammoniac, on account of this substance being the material from which ammonia may be more directly produced, because this substance is used in the arts for a variety of purposes, especially in certain metallurgic operations, and because it constitutes an extensive manufacture. We cannot better accomplish this purpose (which falls indeed into our alphabetical arrangement), than by extracting, verbatim, the account given by Dr. Ure of this material in the Dictionary of Chemistry lately published by that highly meritorious author.

AMMONIAC SAL (SAL AMMONIAC), MURIATE OF AMMONIA. This salt was originally fabricated in Egypt. The dung of camels and other animals constitutes the chief fuel used in that country. The soot is carefully collected; globular glass vessels, about a foot in diameter, are filled within a few inches of their mouth with it, and are then arranged in an oblong furnace, where they are exposed to a heat gradually increased. The upper part of the glass balloon stands out of the furnace, and is kept relatively cool by the air. On the third day the operation is completed, at which time they plunge an iron rod occasionally into the mouths of the globes to prevent them from closing up, and thus endanger the bursting of the glass. The fire is allowed to go out; and, on breaking the cooled globes, their upper part is found to be lined with sal ammoniac in hemispherical lumps about two inches and a half thick, of a grayish white colour, semi-transparent, and possessed of a degree of elasticity; twenty-six pounds of soot yield six of sal ammoniac. The ordinary mode of manufacturing sal ammoniac in Europe, is by combining with muriatic acid the ammonia resulting from the igneous decomposition of animal matters in close vessels. Cylinders of cast iron are charged with bones, horns, parings of hides, and other animal matters; and being exposed to a full red heat, an immense quantity of an impure liquid carbonate of ammonia distils over. Mr. Minish contrived a cheap method of converting this liquid into sal ammoniac: he digested it with pulverised gypsum, or simply made it percolate through a stratum of bruised gypsum; whence resulted a liquid sulphate of ammonia, and an insoluble carbonate of lime. The liquid evaporated to dryness was mixed with muriate of soda, put into large glass balloons, and decomposed by a subliming heat. Sal ammoniac was found above in its characteristic cake, with sulphate of soda remaining below.

M. Leblanc, of St. Denis near Paris, invented another method of much ingenuity, which is described by a commission of French chemists in the 19th volume of the Annales de Chimie, and in the Journal de Physique, for the year 1794; he used tight brick-kilns instead of iron cylinders, for holding the materials to be decomposed. Into one he put a mixture of common salt and oil of vitriol; into another animal matter. Heat extricated from the first muriatic acid gas, and from the second ammonia; which bodies being conducted by their respective flues into a third chamber lined with lead, and containing a stratum of water on its bottom, entered into combination, and precipitated in solid sal ammoniac on the roof and sides, or liquid at the bottom.

In the 20th volume of the Annales a plan for employing bittern or muriate of magnesia to furnish the acid ingredient is described. An ingenious process on the same principles was some time ago commenced at Borrowstounness in Scotland, by Mr. Astley. He imbued in a stove-room, heated by brick flues, parings of skins, horns, and other animal matters, with the muriate of magnesia, or mother water of the sea salt works. The matters thus impregnated and dried, were subjected in a close kiln to a red heat, when the sal ammoniac vapour sublimed, and was conducted either in a solid form into an adjoining chamber or chimney, or else into a stratum of water on its bottom. Muriate of magnesia at a red heat evolves muriatic acid gas; an evolution probably aided in the present case by the affinity of ammonia.

From coal soot likewise a considerable quantity of ammonia in the state of carbonate and sulphate may be obtained, either by sublimation or lixiviation with water. These ammoniacal products can afterwards be readily converted into the muriate as above described. M. Leblanc used a kettle or eolipile for projecting steam into the leaden chamber to promote the combination. It is evident that the exact neutralization essential to sal ammoniac might not be hit at first in these operations; but it could be afterwards effected by the separate addition of a portion of alkaline or acid gas. As the mother waters of the Cheshire salt-works contain only 3½ per cent. of muriate of magnesia, they are not suitable like those of sea-salt works for the above manufacture. For the medicinal properties of sal ammoniac, see MATERIA MEDICA and MEDICINE.

AMMONIAC, GUM. This is a gum resin which consists, according to Braconnot, of 70 resin, 18.4 gum, 4.4 glutinous matter, 6 water, and 1.2 loss, in 100 parts. It forms a milky solution with water; is particularly soluble in alcohol, and entirely so in æther, nitric acid, and alkalies. Specific gravity, 1.200. See MATERIA MEDICA and MEDICINE.

AMMONIAC, } ἄμμος, sand: Ἄμμων, a
AMMONI'ACAL. } name of the Lybian Jupiter, in which country these substances are found. The name of a drug; also of a salt called sal ammoniac, to which the adjective exclusively applies.

Human blood calcined yields no fixed salt; nor is it a sal ammoniac; for that remains immutable after repeated distillations; and distillation destroys the ammoniacal quality of animal salts, and turns them alkaline; so that it is a salt neither quite fixed, nor quite volatile, nor quite acid, nor quite alkaline, nor quite ammoniacal; but soft and benign, approaching nearest to the nature of sal ammoniac. *Arbuthnot.*

AMMONITÆ, in natural history. See CORNU AMMONIS.

AMMONITES, a people descended from Ammon the son of Lot. They destroyed the giants or princes called Zamzummims (Deut. ii. 17—21), and seized upon their country. God forbade Moses, and by him the children of Israel (*ib.* 19), to attack the Ammonites, because he did not intend to give their land to the Hebrews. Before the Israelites entered Canaan, the Amorites had taken great part of the countries belonging to the Ammonites and Moabites. These Moses retook from the Amorites, and divided between the tribes of Gad and Reuben. The history of the Ammonites is scattered through the books of Judges, Samuel, Kings, &c.; and the prophet Ezekiel denounces their entire destruction. Nebuchadnezzar, in fulfilment of this threatening, made war against the people that dwelt upon the confines of Judea, A.M. 3420. Antiochus the Great took Rabboth, their capital, demolished the walls, and put a garrison in it, A.M. 3806. During the persecutions of Antiochus Epiphanes, Josephus informs us that the Ammonites showed their hatred to the Jews, and exercised great cruelties against such of them as lived about their country; but Origen assures us that in his time their very name was extinct, and the few remnants of this people were known only under the general appellation of Arabians. Their limits to the west and north were the river Jabbok, whose course is nowhere determined; though Josephus says that it runs between Rabboth-Ammon, or Philadelphia, and Gerasa, and falls into Jordan. They had also the river Arnon on the west, which divided them from the land of Gilead, or the tribe of Gad; on the south they had the Ishmaelites, on the east the deserts of Arabia, and on the north the hills of Gilead and Bashan.

AMMONIUS, surnamed Lithotomus, a celebrated surgeon of Alexandria; so called from his inventing the operation of extracting the stone from the bladder.

AMMONIUS, surnamed Saccas, was born in Alexandria, and flourished about the beginning of the third century. He was one of the most celebrated philosophers of his age; and, adopting with alterations the Eclectic philosophy, laid the foundation of that sect which was distinguished by the name of the New Platonics. See ECLECTICS and PLATONISM. This learned man was born of Christian parents, and educated in their religion; the outward profession of which, it is said, he never deserted. As his genius was vast and comprehensive, so were his projects [illegible]; for he attempted a general [illegible] of all sects, whether philosophical or religious, by framing a system of doctrines which he imagined calculated to unite them all, the Christians not excepted, in the most perfect harmony. In pursuance of this design, he maintained that the great principles of all philosophical and religious truth were to be found equally in all sects; that they differed from each other only in their method of expressing them, and in some opinions of little or no importance; and that, by a proper interpretation of their respective sentiments, they might easily be united into one body. Accordingly, all the Gentile religions, and even the Christian, were to be illustrated and explained by the principles of this universal philosophy; the fables of the priests were to be removed from Paganism, and the comments and interpretations of the disciples of Jesus from Christianity. In conformity to this plan, he insisted that the religious systems of all nations should be restored to their original purity, and reduced to their primitive standard, viz. the ancient philosophy of the east, preserved uncorrupted by Plato: and he affirmed that this project was agreeable to the intention of Jesus Christ, whom he acknowledged to be an excellent man, the friend of God; whose sole view in descending upon earth was to set bounds to the reigning superstition, to remove the errors that had blended themselves with the religions of all nations, but not to abolish the ancient theology from which they were derived. He therefore adopted the doctrines which were received in Egypt concerning the universe and the Deity, considered as constituting one great whole; concerning the eternity of the world, the nature of souls, the empire of Providence, and the government of the world by dæmons. He also established a system of moral discipline, which allowed the people in general to live according to the laws of their country and the dictates of nature; but required the wise to exalt their minds by contemplation, and to mortify the body, so that they might be capable of enjoying the presence and assistance of the dæmons, and of ascending after death to the presence of the Supreme Parent. In order to reconcile the popular religions, and particularly the Christian, with this new system, he made the whole history of the heathen gods an allegory; maintaining that they were only celestial ministers, entitled to an inferior kind of worship. This plausible system, so flattering to the easy and indifferent in regard to religion, and so comprehensive and complying in its progress, was the source of innumerable errors and corruptions in after times. At its first establishment it is said to have had the approbation of Athenagoras, Pantænus, and Clemens the Alexandrian, and of all who had the care of the public school belonging to the Christians at Alexandria. It was afterwards adopted by Longinus (the celebrated author of the treatise on the Sublime), Plotinus, Herennius, Origen, Porphyry, Jamblicus the disciple of Porphyry, Sopater, Edisius, Eustathius, Maximus of Ephesus, Priscus, Chrysanthius the master of Julian, Julian the apostate, Hierocles, Proclus, and many others both pagans and Christians. Ammonius left nothing in writing behind him; and imposed a law upon his disciples, it is said, not to divulge his doctrines among the multitude.

Ammonius, the grammarian, flourished at Alexandria at the end of the fourth century. A lexicon of Greek synonymes, printed at Venice in 1497, is attributed to him.

Ammonius (Levinus), a Carthusian monk in Flanders, was greatly esteemed by Erasmus and other eminent men for his learning and piety. He died at Ghent in 1556.

AMMOPHILA, in entomology, the sand-wasp; a genus of animals of the class insectæ, order hymenoptera. Generic Character: snout inflected; jaws forcipated; antennæ filiform; eyes oval; wings planed; sting concealed in the abdomen. The species of this genus resemble the sphex in economy as well as in form.

AMMOSCHISTA, in natural history, a genus of stones of a laminated structure, which split only horizontally into flat plates. There are six species. They are coarse, harsh, and rough, of a very loose and porous texture; are pretty heavy, and composed of a large obtuse-angular grit, surrounded and in part held together by an earthy spar. They effervesce violently with aquafortis, but do not easily strike fire with steel.

AM'MUNITION. Lat. *munio, munitum*, to fortify; *ἀμύνω*, to look after. *Choses à munition*, things for the fortresses; military stores, or any hostile materials to be used in defence.

The colonel staid to put in the *ammunition* he brought with him, which was twelve barrels of powder, &c. *Clarendon.*

As Jove's loud thunderbolts were forg'd by heat,
The like our cyclops on their anvils beat;
All the rich mines of learning ransack'd are,
To furnish *ammunition* for this war;
Uncharitable zeal our reason whets,
And double edges on our passions sets.
Denham's Progress of Learning.

My uncle Toby was sadly put to it for proper *ammunition*; I say proper *ammunition*,—because his great artillery would not bear powder.
Sterne's Tristram Shandy.

Ammunition, arms, utensils of war, gunpowder, imported without licence from his majesty, are, by the laws of England, forfeited, and triple the value. And such licence obtained, except for furnishing his majesty's public stores, is to be void, and the offender to incur a premunire, and be disabled to hold any office from the crown.

Ammunition Bread, in military affairs, such as is contracted for by government, and served in camp, garrison, and barracks

Ammunition Shoes, stockings, shirts, stocks, &c., such of those articles as are served out to the private soldiers by government.

Ammunition Wagons are generally four-wheel carriages with shafts; the sides railed in with staves and raves, and lined with wicker-work, so as to carry bread and all sorts of tools. The ammunition cart is of a similar construction, drawn by two horses.

AMNA, in natural history and medicine, water of a whitish colour impregnated with lime, and found in limy places of England and elsewhere. The word is much used in this sense by Paracelsus, &c.

AMNESIA, in medicine, loss of memory; sometimes the consequence of febrile diseases, when it generally recedes as the patient gains strength. As the consequence of old age it can hardly be expected to be cured.

AM'NESTY. *Ἀμνηστία*; *a*, privative particle, *μνάομαι*, to remember; Fr. *amnistie*. Forgetfulness; abolition; act of oblivion; general pardon to rebels or deserters.

We learn from ancient history that Thrasybulus passed a general *amnesty* for all; and first introduced that word, as well as practice, into Greece.
Hume's Essays.

AMNION, Amnios, Lat. perhaps from *ἀμνὸς*. The innermost membrane with which the fœtus in the womb is immediately covered, and with which the rest of the secundines, the chorion, and alantois, are ejected after birth. It is whiter and thinner than the chorion. It also contains a nutritious humour, separated by glands for that purpose, with which the fœtus is preserved. It is outwardly clothed with the urinary membrane and the chorion, and has its vessels from the same origin as the chorion. See Fœtus.

Amnion, in botany, the liquor in the succulus colliquamenti, or vesicle of the seed, from which the cotyledons are formed.

AMNIOTIC Fluid or Liquor—Two species of amniotic liquor have been examined by the French chemists: that afforded by the human female, and that procured from the cow. The first is slightly saline to the taste, of a dilute white colour, though by filtration it becomes transparent. It froths by agitation; becomes semiopake when heated; changes the colour of tincture of violets to green, and slightly reddens that of turnsole. The acids clarify it; alcohol throws down a light precipitate, infusion of gall-nut, a brown one very copiously, and nitrate of silver a white one, insoluble in nitric acid. It appears, therefore, to be composed of an albuminous matter, similar to that of the blood; a muriatic salt, probably muriate of soda; and a small quantity of free or carbonated alkali. Its specific gravity is 1.005. The liquor obtained from the amnios of the cow is of a brownish red colour, an acid bitterish taste, a viscous consistence, and an odour much like that of vegetable extract. It reddens the tincture of turnsole, gives an abundant precipitate with muriate of barytes, and deposits a large quantity of reddish matter by the action of alcohol. Its specific gravity is 1.028. On evaporation a thick scum rises to the surface, and after being reduced to a quarter of its bulk, a number of long, acid, needle-form crystals are produced as the liquor cools; on continuing the process, till the matter is brought to the consistence of honey, a fresh deposition of crystals takes place, which differ in form from the preceding, and are sulphate of soda. The extractive matter, on separation, has the appearance of a compact adhesive cement, of a reddish brown colour, and a peculiar indescribable flavour; and the crystal first obtained, exhibiting properties different from those of all the known acids, has received the denomination of the amniotic acid, an acid first discovered in the amniotic liquor of the cow; it combines readily with the caustic alkalies, forming a very soluble salt, but will not decompose the carbonated alkalies without the assistance of heat. It is separated from its alkaline combinations by the mineral acids, in form of a white crystalline pow-

der, and produces no change in the aqueous solution of the alkaline earths. It is destroyed by heat, leaving behind a spongy coal. *Annales de Chimie*, vol. xxxiii. p. 269.

AMNON, the eldest son of David king of Israel, by Ahinoam of Jezreel. His ungovernable passion for his sister Tamar, and its consequences, are narrated in 2 Sam. xiii. These events happened about A.M. 2974 and 2976.

AMŒBÆUM, in ancient poetry, a kind of poem representing a dispute between two persons, who are made to answer each other alternately; such as the third and seventh of Virgil's eclogues.

AMOENBURG, a town and bailiwick of Upper Hesse, Germany. The bailiwick comprenends the town of Neustadt, and contains altogether 19 villages, and 9000 inhabitants.

AMOGLOSSUS, in ichthyology, a species of fish resembling the sole, and in some parts of England called the lantern. It is flat, very slender, pellucid, and white; never exceeds three inches in length; and is extremely smooth to the touch.

AMOK, or AYMACK. See AMUCK.

AMOL, or JIHON, a river of Tartary, in Bukharia.

AMOL, or AMU, a town of Asia, in Great Bukharia, seated on the river Amol, or Jihon, taken in 1392 by Tamerlane, and still a considerable place. It is distant 150 miles west of Samarcand, and 300 north of Herat.

AMOL, in Persia. See AMUL.

AMOMI, in commerce, Jamaica pepper.

AMOMUM, GINGER, a genus of the monogynia order, belonging to the monandria class of plants. The characters are: CAL. an obscure three-toothed perianthium above: COR. monopetalous; the tubus short; the limbus tripartite: STAM. an oblong filament, with the anthera adjoining: PIST. a roundish germen beneath; the stylus filiform; the stigma obtuse: PER. leathery, subovate, trigonous, trilocular, and three-valved: SEEDS numerous. Of this genus there are four species, viz. 1. A. Cardamomum, or cardamom, a native of India, little known in this country except by its seeds, which are used in medicine. 2. A. Grana Paradisi, likewise a native of the East Indies. 3. A Zerumbet, or wild ginger; and 4. A. Zingiber, or common ginger, is a native of the east, and also of some parts of the West Indies; where it grows naturally without culture. —The commentators on Pliny and Dioscorides differ about the ancient amomum; but most of them suppose it to be a fruit different from ours. Some suppose it to have been the rose of Jericho. F. Camelli is positive he has discovered the real amomum of Dioscorides in the tugus, birao, or caropi, of the Philippine islands; the grains or berries whereof are worn by the natives about their necks, both on account of their agreeable odour, and of their supposed virtue in preserving from infection, curing the sting of the scolopendra, &c. Phil. Trans. N°. 248. Scaliger is confident that the amomum of the ancients was not a fruit, but the wood itself, which bore some resemblance to a bunch of grapes, and was particularly used in embalming of bodies, a. d hence, says he, the term MUMMY was given to the bodies of the Egyptians embalmed with it. The ancient amomum was certainly of various kinds; but the Armenian was most esteemed. It was a heater, drier, and astringent; used as a narcotic to appease pain, cure poisonous bites, inflammation of the eyes, &c.

AMON, a small river of Scotland, which divides the counties of Edinburgh and Linlithgow, and falls into the Frith of Forth at the village of Nether Cramond.

AMON, the son of Manasseh, the fourteenth king of Judah. His wicked and short reign of two years, with his murder by his own servants, and the vengeance taken of them by the people, A. D. 3308, are recorded in 2 Kings xxi. and 2 Chron. xxxiii.

AMONG', *adv.* & *prep.* } According to Tooke
AMONGST'. } the preterperfect of ȝemanȝ, ȝemonȝ, or among, amang, from mænȝan, to mix. Hence mixed, placed with other persons or things; conjoined with others so as to make part of the aggregate. Amonges in our old writers.

He tok his suerd in hand, pe croyce let he falle,
And medeled him in pe pres, *among* pebarono alle. *R. Brunne*, p. 18.

pis lord was deled a pre *among* pre sones y wys. *R. Gloucester*, p. 23.

I stonde as one *amongest* all
Whiche am oute of hir grace fall.
Gower, Con. A. b. viii.

But it is not so *among* you, but whoever wole be maad grettere schal be youre mynystre: and who ever wole be the firste *among* you schal be servaunt of alle. *Wiclif. Mark.* c. x.

BIL. Marry, my good lord, quoth he, your lordship shall ever find *amongst* an hundred Frenchmen, forty hot shots; *amongst* an hundred Spaniards, threescore braggarts; *amongst* an hundred Dutchmen, fourscore drunkards; *amongst* an hundred Englishmen, fourscore and ten madmen; and *amongst* an hundred Welchmen——

BIAN. What, my lord?

BIL. Fourscore and nineteen gentlemen.
Marston's Malcontent, act iii. sc. 1.

AMONOOSUCK, UPPER and LOWER, two rivers of New Hampshire, North America, which have retained their Indian name. They rise in the White Hills, the former on the northern, and the latter on the western side. After a course of fifteen miles, the Upper Amonoosuck approaches the Amoriscoggin river within about three miles, across which there is a carrying place. It now runs south-west and west about eighteen miles into the Connecticut at Northumberland. The latter, sometimes called the great Amonoosuck, and remarkable for the virtues of its streams, also falls into the Connecticut, after receiving from the Franconia and Lincoln mountains a considerable stream, about forty yards wide at its junction with this river, called the Wild Amonoosuck. This is about two miles from its mouth, which is just above the town of Haverhill, in Lower Coos, and is 100 yards wide.

AMONTONS (William), a French mechanic, born in Normandy in 1663, who, contracting a deafness that almost excluded him from conversation, applied himself closely to geometry and the construction of mathematical instruments. He invented a hygroscope, and contrived a sort

of telegraph: besides which he wrote Remarques et Experiences Physiques sur la Construction d'une Nouvelle Clepsydre, sur les Barometres, Thermometres, et Hygrometres; and several contributions to the Journal des Sçavans. He died in 1705.

AMORÆANS, from אמר, *dixit*, he hath said, a sect of gemaric doctors, or commentators on the Jerusalem Talmud. The Amoræans succeeded the Mischnic doctors. They subsisted 250 years; and were succeeded by the Seburæans.

AMORBACH, or AMERBACH, a town of Germany, with 1500 inhabitants, a castle and upper bailiwick, in the Odenwald; twenty miles north-east of Heidelberg, near the Benedictine abbey of the same name, and at the conflux of the small rivers Mudt and Bilbach. The bailiwick contains, besides the town, seventy villages and 18,000 inhabitants, on an extent of 200 square miles. It has considerable forests, and yields about £5200 of yearly revenue. The abbey was very rich, its total income being little below £14,000 a-year. In 1802 the town and bailiwick were granted in indemnity to the Prince of Leiningen; from him they went to Baden, and from Baden to the grand duke of Hesse.

AMORE, in ichthyology, a genus of fishes of which there are three species, all fit for eating, but the pixuma is esteemed the best: viz. 1. A. guaca of an oblong figure, and about six inches in length. Its head is thick, gills large, and teeth small. 2. A. pixuma has a broad head and large mouth, but no teeth. 3. A. tinga, like the guaca, but much smaller, and covered with whitish scales spotted with brown spots. All the three species are found on the coast of America, particularly that of Brasil.

AMORETTE', AM'ORIST, AM'OROUS, AM'OROUSLY, AM'OROUSNESS, AMOUR'. Fr. *amour*, love. This entire class of words has a reference more or less to intrigue, gallantry, or excessive fondness. Amorous and its derivatives also signify easily inspiring, or inspired with love.

Of armes he was desyrous,
Chiualrous and *amorous*.
And for the fame of worldes speche,
Strange auentures wolde he seche.
Gower. Con. A. b. i.

For also well woll loue be sette,
Under ragges as riche rotchette;
And eke as well by *amorettes*,
In mourning black, as bright burnettes.
Chaucer's Romaunt of the Rose, f. 138. c. iii.

For whosoever esteemeth too much of *amorous* affection, quitteth both riches and wisdom.
Lord Bacon's Essays.

MEL. And will she not return? then may the sun
Stable her horses ever, and no day
Gild the black air with light! If in mine eye
She be not placed, what object can delight it?
TAS. Excellent *amorist*. Here's to thee, melancholy. *Nabbes's Microcosmus.* act. iii.

LUC. Are you so formal, Sir? well, I must wait,
And watch withal; for, but I be deceiv'd,
Our fine musician groweth *amorous*.
Shakspeare's Taming of the Shrew, act. iii. sc. 1.

I shall range all old *amorous* dotards under the denomination of grinners. *Steele.*

No man is of so general and diffusive a lust, as to prosecute his *amours* all the world over; and let it burn never so outrageously, yet the impure flame will either die of itself, or consume the body that harbours it. *South.*

When *amorets* no more can shine,
And Stella owns she 's not divine,
Then sense and merit shall supply,
The blushing cheek, the sparkling eye.
Dr. J. Warton's Poems.

Chauntress of night, whose *amorous* song
First heard the tufted groves among;
Warms wanton Mabba to begin
Her revels on the circled green.
Dr. Warton's Ode on the Nightingale.

AMORGE, in natural history, ἀμοργη. 1. The fæces of expressed oil. 2. The purple dye made in the island of Amorgos.

AMORGINON, in antiquity, ἀμόργινον, or, in the feminine ἀμαργινα; a vestment made of the amorgis or flax in the island of Amorgus.

AMO'RGIS, ἀμοργις, was the flax, not unlike byssus, from which the ἀμοργινα were made in the island of Amorgus.

AMORGOS, or AMURGUS, in ancient geography, now Morgo, not far from Naxus to the east, one of the European Sporades; the country of Simonides the Iambic poet. To this island criminals were banished. It was famous for a fine flax called amorgis.

AM'ORILY. Merrily.

The second lesson Robin Redbreast sang,
Haile to the God and goddes of our lay;
And to the lectorn *amorily* he sprang,
Haile (qd. eke.) O fresh season of May.
Chaucer. The Court of Love, f. 355, c. iii.

AMORIS, POMUM, in botany, the solanum lycopersicum of Linnæus.

AMORISCO, in music, in a Moorish style; an expression applied to old English ballads, meaning that the air is to resemble a Moorish dance.

AMORISCOGGIN, a river of Maine, in the United States, North America, which runs into the Kennebeck.

AMORITES, a people descended from Amorhæus, according to the Septuagint and Vulgate; Emoræus, according to other expositors; Hæmori, according to the Hebrew; or Emor, according to our version of the Bible, who was the fourth son of Canaan, Gen. x. 16. They first peopled the mountains lying to the west of the Dead Sea, and had likewise establishments to the east of it, between the brooks of Jabbock and Arnon, from whence they forced the Ammonites and Moabites. Numb. xiii. 30. xxi. 29. Josh. v. 1. and Judges xi. 19, 20 Moses made a conquest of this country from their kings Sihon and Og. A.M. 2553

AMORIUM, a town of Phrygia Major, near the river Sangarius, on the borders of Galatia. It was taken from the Romans by the Saracens in 668, but soon after retaken. A war breaking out again between these two nations, A.D. 837, the Roman emperor Theophilus, destroyed Sozopetra the birth-place of the caliph Al Motasem, notwithstanding his earnest entreaties to spare it. This so enraged the caliph, that he ordered all his men to engrave upon their shields the word Amorium, the birth-place of Theophilus, which he resolved at all events to destroy. Accordingly he laid siege to the place, but met with a vigor-

ous resistance. At length it was betrayed by one of the inhabitants who had abjured the Christian religion. The caliph now put the men to the sword, carried the women and children into captivity, and levelled the city with the ground. His forces being distressed for want of water on their return home, the Christian prisoners rose upon some of them, and murdered them; upon which the caliph put 6000 of the prisoners to death. According to the eastern historians, 30,000 of the inhabitants of Amorium were slain, and as many carried into captivity.

AMOROSO, in music, denotes a slow and soft movement; a tranquil and tender expression in the melody. The notes should be blended together, and gently accented.

AMORPHIA, false indigo, in botany, a genus of the decandria order, belonging to the diadelphia class of plants; and in the natural method ranking under the thirty-second order, papilionaceæ. The characters are: CAL. a single-leaved perianthium, tubular and persistent: COR. an ovate, concave, erect petal, scarcely larger than, and placed on the upper side of the calyx: STAM. of ten erect equal filaments, longer than the corolla; the antheræ simple: PIST. a roundish germen; the stylus subulated, and the length of the stamina; the stigma simple: PERI. a lunated unilocular legumen, reflected, larger than the calyx, and tuberculated: the seeds are two, and kidney-shaped. By the corolla alone this genus may be distinguished from all known plants. The petals are the banner, the wings and keel are wanting; which is very singular in a papilionaceous corolla. There is only one known species, a native of Carolina, where the inhabitants formerly made from it a coarse kind of indigo, whence the plant took its name.

AMORT. } Fr. *amorti*, participle,
AMOR'TIZE, or } (from *amortir*): as though
AMORTISE, } dead, depressed, spiritless.
AMORTIZA'TION, } Amortir, to destroy, kill,
AMOR TIZEMENT. } deaden.

But for as moche as the goode werkes that men don while they ben in good lif, ben all *amortized* by sinne following, and eke with all the good werkes that men don while they ben in dedly sinne, ben utterly ded, as for to have the lif perdurable.

Chaucer. The Persones Tale, vol. ii. p. 296.

My Lord of Bristow's re-entry into the court (who the last vveek carried the sword before the the king), filleth us vvith new discourse as if he should be restored to the vice-chamberlainship vvich yet lyeth *amortized* in your noble friend. *Reliquiæ Wottonianæ.*

Every one of the religious orders was confirmed by one pope or other; and they made an especial provision for them, after the laws of *amortization* were devised and put in use by princes.

Ayliffe's Parergon Juris Canonici.

This did concern the kingdom, to have farms sufficient to maintain an able body out of penury, and to *amortize* part of the lands unto the yeomanry, or middle part of the people. *Bacon.*

Now where's the bastard's braves and Charles his gleeks?
What, all *a-mort*? Roan hangs her head for grief,
That such a valiant company are fled.

Shakspeare. First part of Henry VI. act iii. sc. 2.

DIN. Do not dissemble
I know you are high and jovial.—
NOV. Jovial! doctor;
No, I am all *amort*, as if I had lain
Three days in my grave already.

Massinger's Par. of Love, act iv. sc. 5.

Chærea, when he came from Pamphila's house, and had not so good welcome as he did expect, was all *amort*. *Burton's Anatomy of Melancholy.*

AMORTIZATION, from *amortir*, Fr. to extinguish, in law, the alienation of lands or tenements to a corporation or fraternity and their successors. See MORTMAIN.

AMOR'WE, } On the morrow. In the
AMOR'NINGS. } morning.

þoþe kynge's men nuste *amorwe*, wer he was bi come,
Heo ferde as wodemen, and wende he were ynome.

R. Gloucester, p. 159.

And *amorewe* it was don that the pryncis of hem, and the eldere men, and scribis waren gaderid in ierusalim. *Wicklif. Dedis*, chap. iv.

A-morwe whan the day began to spring,
Up rose our hoste, and was our aller cok,
And gaderd us togeder in a flok.

Chaucer. The Prologue, vol. i. p. 34.

GENT. On with it, Jacques, thou and I
Will live so finely in the countrey, Jacques,
And have such pleasant walks into the woods
Amornings, and then bring home riding rods,
And walking staves.

Beaumont and Fletcher. Noble Gent. act ii.

AMORY (Thomas), a dissenting minister of some eminence, and pastor of the Old Jewry meeting, was born at Taunton in 1701, and died in 1774. His works consist of sermons, A Dialogue on Devotion; Forms of Devotion for the Closet; The Life of Mr. Henry Grove; Memoirs of Dr. Benson, and of Dr. Sam. Chandler.

AMOS, אמוס, Heb. i. e. burdening. The third of the twelve minor prophets, who in his youth had been a herdsman, and retired to Tekoa, his native place, where his principal predictions were delivered about B. C. 787. Bishop Lowth pronounces him nearly equal to the very first of the prophets in elevation of sentiment and loftiness of spirit, and scarcely inferior to any in splendour of diction and beauty of composition. *De Sac. Poesi, Heb.* Prœl. xx.

AMOTAPE, a town of Peru, in the corregimiento of Piura, on the coast of the South Sea, about a mile from a river of the same name. It is in the direct road to Piura, and there are some valuable mines of naphtha in the neighbourhood, that furnish a considerable trade. S. lat. 4° 50'. Long. 30° 42'.

AMOUALA, a sea-port on the north-east of Madagascar, opposite to the isle of Nosse. It is governed by a chief, who is subject to the queen of the Seclaves. The country produces a great quantity of wax and tortoise-shells; in the former of which it pays tribute.

AMOUNT', *v.* & *n.* Old Fr. *amonter*, (supposed to come from the Latin *ad montem*, to the mountain,) to arrive at an end, or point in an ascending course. To come to in the whole, or altogether.

And William wist of alle, what it suld *amounte*
Of lordying and of thralle pe extente porgh acounte.

R. Brunne, p. 83.

I not what ye fortune acoumpte,
But what thinge danger maie *amounte*
I wot wel: for I haue assaied.

Gower, Con. A. b. viii.

So up he rose, and thence *amounted* streight,
Which when the carle beheld, and saw his guest
Would safe depart, for all his subtile sleight;
He chose an halter from among the rest,
And with it hung himselfe, unbid, unblest.
Spenser's Faerie Queene, b. i. c. 1.

The errors of young men are the ruin of business; but the errors of aged men *amount* but to this, that more might have been done, or sooner. *Bacon.*

Judgments that are made on the wrong side of the danger, *amount* to no more than an affectation of skill, without either credit or effect. *L'Estrange.*

Let us compute a little more particularly how much this will *amount* to, or how many oceans of water would be necessary to compose this great ocean rolling in the air without bounds or banks.
Burnet's Theory.

And now, ye lying vanities of life,
Where are you now, and what is your *amount?*
Vexation, disappointment, and remorse. *Thomson.*

I thought, I'll swear, I could have loved no more
Than I had done before;
But you as easily might account,
Till to the top of numbers you *amount*
As cast up my love's score.
Cowley's Poems. Increase.

AMOVE', AMO'VAL, AMO'TION, Lat. *amoveo*, to remove from a post or station.

Whan she had herd all this, she not *ameved*
Neyther in word, in chere, ne countenance,
(For as it semed, she was agreved)
She sayde.
Chaucer. The Clerke's Tale, vol. i. p. 339.

Therewith *amoved* from his sober mood,
'And lives he yet,' said he, 'that wrought this act,
And doen the heavens afford him vital food.'
'He lives,' quoth he, 'and boasteth of the fact,
Ne yet hath any knight his courage crackt.'
Spenser's Faerie Queene, b. ii. c. 1.

AMOVENDO CUSTODE, amoving a guardian. See CUSTODE.

AMOUSES, in chemistry, counterfeit gems.

AMOUSHE, RASEL, the Battal of Edrisi, a large cape formed by the mountains of the Shenooah, on that part of the sea-coast of Africa, called the province of Tlemsan. At a small distance is the Mers 'el Amoushe, or port of Amoushe, which is safe in westerly winds. Vide *Shaw's Travels.*

AMOY, EMOUY, or HIAMEN, an island in the province of Fokien, in the south-east of China, where the English formerly had a factory: it is about fifteen miles in circuit, and has a fort formed between the island and the main, which was resorted to formerly by Europeans, but abandoned when foreign commerce was restricted to Canton. Here there are several temples, particularly one of great celebrity dedicated to the god Fo, whose statue of colossal size is contained in it. Long. 118° 22′ E., lat. 24° 30′ N.

AMPANA, a genus of plants in the Hortus Malabaricus, the BORASSUS of Linnæus, which see.

AMPELION, in medicine, vine leaves, which are good for making pessaries. *Hippocrat. de Nat. Mulieb.*

AMPELIS, in botany, the vine. See VITIS.

AMPELIS, in ornithology, the chatterer, a genus of birds belonging to the order of passeres; the distinguishing characters of which are, that the tongue is furnished with a rim or margin all round, and the bill is conical and straight. There are seven species, all natives of foreign countries, except the garrulus, which is a native both of Europe and the West Indies.

AMPELIS is also the name of a species of magpie, called by some ornithologists garrulus bohemicus. See GARRULUS.

AMPELITES, CANAL COAL, or CANDLE-COAL, called also PHARMACITIS, a hard, opaque, fossile, inflammable substance, of a black colour; it does not effervesce with acids. The ampelites, though much inferior to jet in many respects, is yet a very beautiful fossil; and, for a body of so compact a structure, remarkably light. Examined by the microscope it appears composed of innumerable very small and thin plates, laid closely and firmly on one another, and full of small specks of a blacker and more shining matter than the rest, which is evidently a purer bitumen. There is a large quarry of it near Alençon in France. It is dug in many parts of England, but the finest is in Lancashire and Cheshire: it lies usually at considerable depths. In the fire it flames violently at first, continues red and glowing hot a long time, and finally is reduced into a small portion of gray ashes. It is capable of a very high and elegant polish; and, in the countries where it is produced, is manufactured into toys, snuff-boxes, and the like, which bear all the nicety of turning, and are made to pass for jet. Husbandmen smear their vines with it, as it kills the vermin which infest them. It is likewise used for dyeing hair black. In medicine, it is reputed good in cholics, against worms, and as being in general an emollient and discutient.

AMPELODESMOS, in botany, from ἄμπελος, a vine, and δεσμὸς, a band; a kind of herb with which the vines in Sicily used to be tied.

AMPELOLEUCE, in botany; the name of a white sort of vine mentioned by Pliny. *Nat. Hist.* l. 23. c. 1.

AMPELOPRASUM, in botany, from ἄμπελος, a vine, and πράσον, a leek; a herb growing among vines, also called leek-vine, a species of the allium of Linnæus.

AMPELUSIA, in ancient geography, a promontory of Mauritania Tingitana, now Cape Spartel. Long. 5° 56′ W., lat. 36° 0′ N.

AMPFING, a parochial village on the Iser, in Lower Bavaria, circle of the Iser, district of Muhldorf, near which Frederick of Austria was defeated in 1322, and taken prisoner. It is fifteen miles south of Dingelfingen.

AMPHEMERINE; from ἀμφὶ, about, and ἡμέρα, a day; in medicine, a daily distemper, such as a quotidian ague or fever that returns every day.

AMPHERES, or AMPHERICUM; from ἀμφὶ, on both sides; in antiquity, a kind of vessels wherein the rowers plied two oars at the same time, one with the right-hand and another with the left.

AMPHIARAUS, in pagan mythology, called the son of Apollo, a celebrated prophet, who possessed part of the kingdom of Argos. He was said to excel in divining by dreams, and to have been the first who divined by fire. Am-

phiaraus knowing, by the spirit of prophecy, that he should lose his life in the war against Thebes, hid himself in order to avoid engaging in that expedition; but his wife Eriphyle, being bribed by a present, discovered the place in which he had concealed himself; so that he was obliged to accompany the other princes. This proved fatal to him: for the earth being split asunder by a thunderbolt; both he and his chariot were swallowed up in the opening. Amphiaraus, after his death, was ranked among the gods; temples were dedicated to him; and his oracle, as well as the sports instituted to his honour, were very famous. See ERIPHYLE.

AMPHIARTHROSIS; from *ἀμφὶ*, both, and *ἀρθρώσις*, articulation; in anatomy, a term for such junctures of bones as have an evident motion, but different from the diarthrosis, &c. Of this kind is the articulation of the ribs with the vertebræ, and that of the carpus with the metacarpus. See DIARTHROSIS.

AMPHIBALUM. See AMPHIMALLUM.

AMPHIBALUS, a monk, who is said to have converted the bishop protomartyr St. Alban, and to have suffered with him in the tenth persecution under Dioclesian. A work entitled Ad Instituendam Vitam Christianam, and several homilies are attributed to him. *Boeth. Hist. Scot.* l. 6.—See ALBAN, ST.

AMPHIBIA, in zoology, the name of Linnæus's third class of animals; including all those which live partly in water and partly on land. This class he subdivides into four orders, viz. 1. amphibia reptiles; 2. amphibia serpentes; 3. amphibia nantes; and 4. amphibia meantes. See ZOOLOGY. In the last edition of the Systema Naturæ, by Gmelin, the amphibia class consists of two orders, reptilia pedata, and serpentes apodes, which are distinguished by the reptiles being furnished with feet, and the serpents being destitute of them. The nantes pinnati, or breathing fishes, being placed in their natural order amongst the pisces, under the title chondropterygii; that order thus includes the genera acipenser, chimæra, squalus, raja, and petromyzon: the lophius genus is separated from the others, and arranged amongst the pisces branchiostegi. The reptilia comprehend testudo, the tortoise, covered with a shell; draco, the dragon, having wings and a tail; rana, the frog or toad; lacerta, the crocodile, alligator, lizard, newt, salamander, chameleon, eft, the siren, which is two-footed, tailed, and naked. Serpentes comprehend crotalus, the rattle-snake; boa, without a rattle; coluber, the viper, having plates on the belly and scales on the tail; anguis, the snake, having scales under the tail; amphisbæna, having rings on the body; cæcilia, having wrinkles on the body and tail; acrochordus, having tubercles. This is the arrangement of Gmelin, to which must be added the genus siren, a kind of reptile, whose ambiguity of character induced Linnæus to form the new order meantes. Linn. Amœn. Acad. vii. p. 311 —et Syst. Nat. vol. i. part ii. Addend. Gmelin has consigned this creature to the first genus of fishes, muræna; and Dr. Shaw restores it to the siren genus in the appendix to his Zoology, vol. iii. p. 2. Amp. It has been a question, whether the animals commonly called amphibious, live most in the water or on land. The terms *ἀμφὶ*, utrinque, both ways, and *βιος*, vita, life, from which the word amphibious is derived, should indicate that such animals are capable of living as well by land, or in the air, as by water; or of dwelling in either constantly at will: but it will be difficult to find any animal that answers this definition. Dr. Parsons therefore, in a paper inserted in the Transactions of the Royal Society, from considering their economy respectively, divides them into two classes, viz. 1. Such as enjoy their chief functions by land, but occasionally go into the water. 2. Such as chiefly inhabit the water, but occasionally go on shore. What he advances on this subject is curious, and deserves the attention of the reader. Of the first order, this writer particularly considers the phocæ; and endeavours to show, that none of them can live chiefly in the water, but that their principal enjoyment of the functions of life is on shore. See PHOCÆ. These animals, he observes, are really quadrupeds; but as their chief food is fish, they are under the necessity of going out to sea to hunt their prey, and to great distances from shore; taking care, however, that rocks or small islands are at hand, as resting places when they are tired, or when their bodies become too much macerated in the water: and they return to the places of their usual resort to sleep, copulate and bring forth their young. It is well known, he adds, that the only essential difference, as to the general structure of the heart, between amphibious and land animals, or such as never go into the water is, that in the former the foramen ovale remains always open. If such as are without this aperture were immersed in water but for a little time, respiration would cease, and the animal must die; because a great part of the mass of blood passes from the heart by the pulmonary artery through the lungs, and by the pulmonary veins returns to the heart, while the aorta is carrying another part of the mass to the head and extremities, &c. Now, while respiration is gentle and moderate, the blood passes through the lungs in a continual uninterrupted stream; but when it is violent, the circulation is interrupted, for inspiration and expiration are now carried to their extent; and in this state the blood cannot pass through the lungs either during the total inspiration or total expiration of the air in breathing: in the former case, the inflation compresses the returning veins; and, in the latter, by the collapsion of the lungs, these veins are interrupted also; so that it is only between these two violent actions that the blood can pass: and hence it is that the lives of animals are shortened, and their health impaired, when they are subjected to frequent violent respiration. Thus it is also that when animals have once breathed, they must continue to respire ever after. There are three necessary and principal uses of respiration:—the first is, that of promoting the circulation of the blood through the whole body and extremities. The force of the heart in fishes is alone capable of sending the blood to every part, as they are not furnished with those limbs or remoter extremities, which have need of assistance in the circulation. Thus

we see, that in persons subject to asthmatic complaints, the circulation of the extremities is languid, the legs become cold and œdematous, and other parts suffer by the defect in respiration. A second use of breathing is, that in inspiration, a variety of particles, of different qualities, which float always in the air, are drawn into the lungs, and insinuated into the mass of blood; being highly necessary to temperate and cool the agitated mass, and to contribute a refined pabulum, which, meeting with the daily supply of chyle, serves to render its constitution the fitter for supporting life. Therefore it is that valetudinarians, by changing foul or unwholesome air for a purer and more open atmosphere, often recover from lingering diseases. A third principal use of respiration is, to promote the exhibition of voice in animals. The economy of nature, therefore, in the phocæ requires them to make the land their principal residence. But there is another reason also why they reside on shore the greatest part of their time; namely, the flesh of these creatures is analogous to that of other land animals, and, by long maceration, added to the fatigue of their chasing their prey, would suffer such a relaxation as would be fatal. It is well known, that animals which have long lain under water are reduced to a lax and even putrid state; the phocæ therefore enjoys the air on shore. While the solids are at rest, they acquire their former degree of tension, and the vigour of the animal is restored; and while he has an uninterrupted placid respiration, his blood is refreshed by the new supply of air, as explained above, and he is rendered fit for his next cruise.

Let us now examine by what power these creatures are capable of remaining longer under water than land animals. All of them have the oval aperture open between the right and left auricles of the heart; and, in many, the canalis arteriosus also: and while the phoca remains under water, which he may continue to do an hour or two, his respiration is stopped; and the blood, not finding the passage through the pulmonary artery free, rushes through the arterial canal, being a short passage to the aorta, and thence to every part of the body, maintaining the circulation: but, upon rising to come ashore, the blood finds its passage again through the lungs the moment he respires. Thus the fœtus in utero also during its confinement, having the lungs compressed, and consequently the pulmonary arteries and veins impervious, has the circulation of the blood carried on through the foramen ovale and the arterial canal. So far then the phoca in the water, and the fœtus in utero, are preserved by analogous provisions of nature; but they differ in other material circumstances. One is, that the fœtus, having never respired, remains sufficiently nourished by the maternal blood circulating through it, and continues to grow till the time of birth, without any want of respiration; but the phoca, having respired at the moment of its birth, cannot live long without it, for the reasons given before; and this aperture and canal would be closed in them, as it is in land animals, if the dam did not, soon after the birth of the cub, carry it very frequently into the water to keep them open. Another difference is, that the phocæ, as was said before, would be relaxed by maceration in remaining too long in the water; whereas the fœtus in utero suffers no injury from continuing its full time in the amniotic fluid, because while water is a powerful solvent, and penetrates the pores of the skin of land animals, the *liquor amnii* is an insipid soft fluid, impregnated with particles more or less mucilaginous, and utterly incapable of making the least alteration in the cutis of the fœtus. It has been supposed on these grounds, that if the whelp of a true water-spaniel were, immediately after its birth, immersed in water, and respiration thus interrupted for a little time every day, that the dog might be made capable of remaining as long under water as the phoca. On the other hand, frogs, how capable soever of remaining in the water, yet cannot avoid living on land, for they, like the phocæ, respire; and if a frog be thrown into a river, he makes to the shore as fast as he can. The lizard kind, such as may be called water-lizards (see LACERTA), are all obliged to come to land, in order to deposit their eggs, to rest, and to sleep. Even crocodiles, who dwell much in rivers, sleep and lay their eggs on shore; and while in the water are compelled to rise to the surface to breathe; yet, from the texture of their scaly covering, they are capable of remaining in the water longer by far than any species of the phoca, whose skin is analogous to that of a horse or cow. The hippopotamus (see HIPPOPOTAMUS), who wades into the lakes or rivers is a quadruped, and remains under the water a considerable time; yet his chief residence is upon land, and he must come on shore for respiration. The testudo, or sea-tortoise, (see TESTUDO,) though he goes out to sea and is often found far from land, yet, being a respiring animal, cannot also remain long under water. He has indeed a power of rendering himself specifically heavier or lighter than water, and can therefore let himself down to avoid an enemy or a storm; yet he is under a necessity of rising frequently to breathe, for reasons given before; and his most usual situation, while at sea, is upon the surface, feeding upon various floating substances. These animals sleep securely upon the surface, but not under water; and can remain longer at sea than any other of this class, except the crocodile, because, as it is with the latter, his covering is not in danger of being too much macerated; yet they must go on shore to copulate and lay their eggs. Such are the interesting peculiarities noticed by this writer in the first order of the class of amphibious animals.

The second order of amphibia, according to Dr. Parsons' division of them, comprehends such as chiefly inhabit the waters, but occasionally go on shore. These are but of two kinds: the eels and the water-serpents or snakes of all descriptions. It is their form that qualifies them for locomotion on land, and they know their way back to the water at will, having by their structure a strong peristaltic motion, by which they can rapidly go forward; whereas all other kinds of fish, whether vertical or horizontal, are incapable of a voluntary loco-motion on shore. Let us now examine into the reason why these vermicular fish, as they may be called, or eels and ser-

pents, can live a considerable time on land, and the vertical and horizontal kinds die almost immediately when taken out of the water. All land animals have lungs, and can live no longer than while these are inflated by the ambient air, and alternately compressed for its expulsion; that is, while respiration is duly carried on, by a regular inspiration and expiration of atmospheric air. In like manner, fish in general have, instead of lungs, gills or branchiæ: and, as in land animals, the lungs have a large portion of the mass of blood circulating through them, which must be stopped if the air has not a free ingress and egress into and from them; so in fish there is a great number of blood-vessels that pass through the branchiæ, and a great circulation of blood through them, which must in like manner be totally stopped, if the branchiæ are not perpetually wet with water. The air then is to the lungs of land animals a constant assistant in circulation; so is the water to the branchiæ of those of the rivers and seas: for when these are out of the water, the branchiæ grow crisp and dry, the blood-vessels are shrunk, and the blood is obstructed in its passage: as when the former are immersed in water, or otherwise prevented from respiration, the circulation ceases, and the animal dies. Again, as land animals would be destroyed by too much maceration in water, so fishes would, on the other hand, be ruined by too much exsiccation on land; the latter being, from their general structure and constitution, made fit to bear and live in the water; the former, by their constitution and form, to breathe and dwell in the air. If it be asked why eels and water-snakes are capable of living longer in the air than the other kinds of fish; it is answered, that without this their loco-motion would be useless as many of them find food on land. Their branchiæ also are well covered from the external drying air; while a slimy mucus hinders their skin from becoming crisp and dry for many hours. If any fish, when brought out of the water, have their gills and the surface of their skin kept constantly wet, they may be preserved alive a considerable time, even without any water to swim in.

On the principles advanced in the former part of this article, it has been conjectured that man might, by art, be rendered amphibious. The fœtus lives in utero without air, and the circulation is there continued by means of the foramen ovale; preserve this passage open, it has been said, after birth, and the same faculty would continue: accustomed to hold the breath a considerable time every day, the blood might be forced to resume its pristine passage. This conjecture seems in some measure supported by the practice of divers, who are taught from childhood to hold their breath, and keep long under water. A Calabrian monk at Madrid formerly laid claim to this amphibious quality, and offered to the king of Spain to continue twice twenty-four hours under water, without ever coming up to take breath. Kircher gives an account of a Sicilian, named the Fish Colaz, who, by a long habitude from his youth, had so accustomed himself to live in water, that his nature seemed to be quite altered, and he seemed to live rather after the manner of a fish than a man. The pearl-fishers also arrive at a high degree of perfection in this art.

AMPHI'BIOUS, *ἀμφὶ*, a Greek preposition of extensive application, signifying, in its present relation, about, on each side, doubtful; and *βίος*, life. An epithet usually confined to that class of animals which pass their lives partly on land, and partly in water.

> Traulus of *amphibious* breed,
> Motley fruit of mungrel seed;
> By the dam from lordlings sprung,
> By the sire exhaled from dung. *Swift*

> Fishes contain much oil, and *amphibious* animals participate somewhat of the nature of fishes, and are oily. *Arbuthnot.*

> Would you preserve a numerous finny race,
> Let your fierce dogs the ravenous otter chase;
> Th' *amphibious* monster ranges all the shores,
> Darts through the waves, and every haunt explores;
> Or let the gin his roving steps betray,
> And save from hostile jaws the scaly prey.
> *Gay's Rural Sports*, cant. i.

AMPHIBLESTROIDES; from *ἀμφίβληστρον*, a net, and *εἶδος*, the form: the retina, or net-like coat of the eye.

AMPHIBIOLITHUS, a genus of petrifactions in the Linnæan system, so called from its being the part of an amphibious animal petrified. The species most common are, 1. testudo, the tortoise; 2. rana, the toad; 3. crocodilus the crocodile, which last have been found both in England and France.

AMPHIBOLITES, in geology, trap rocks, the basis of which is amphibole or hornblende.

AMPHIBO'LOGY, AMPHIBOLO'GICAL, AMPHI'BOLY, AMPHI'BOLOUS. *Ἀμφὶ*, about; *βάλλω*, to cast; and *λόγος*, speech. A phrase or sentence that will bear two meanings, distinguished from equivocation which refers to single words only.

> He hath nat wel the goddes vnderstoude,
> For goddes speke in *amphibologies*.
> And for o sothe they tellen twentie lies.
> *Chaucer. Troilus and Creseide*, b. iv. f. 183. c. iii.

> Now the fallacies whereby men deceive others and are deceived themselves, the ancients have divided into verbal and real; of the verbal, and such as conclude from mistakes of the word, there are but two worthy of our notation; the fallacy of equivocation and *amphibology*.
> *Brown's Vulgar Errours.*

> Never was there such an *amphibolous* quarrel, both parties declaring themselves for ye king.
> *Howell.*

AMPHIBOLOGY; from *ἀμφίβολος*, ambiguous, and *λόγος*, discourse; in grammar and rhetoric a term used to denote a phrase susceptible of different interpretations. Amphibology arises from the order of the phrase, rather than from the ambiguous meaning of a word. Of this kind was that answer which Pyrrhus received from the oracle: 'Aio te, Æacida, Romanos vincere posse;' where the words 'te' and 'Romanos,' may either of them precede, or either of them follow, the words 'posse vincere,' indifferently; and therefore the response of the oracle could bear to be translated, either that 'Pyrrhus should conquer the Romans,' or that 'the Romans should conquer Pyrrhus.' As the English language usually runs in the natural order, it is

not easily capable of amphibology, as the French and most other modern tongues.

AMPHIBRACHYS; from *ἀμφὶ*, both, and *βραχὺς*, short; in ancient poetry, the name of a foot consisting of three syllables, whereof that in the middle is long, and the other two short; such is the word *ămārĕ*.

AMPHIBRANCHIA, in anatomy, parts about the tonsils, or kernels in the jaws, which serve to moisten the throat.

AMPHICAUSTIS, in botany, a sort of wild barley.

AMPHICEDA, in entomology, a species of the papilio. Its principal characters are that it is brown, with its wings indented above, with a connected disk of cinereous waved with brown, beneath the tips are gray with black lunated marks. Above, the base and margins entirely brown; cinereous in the middle, with two undulated waves, the first brown, the second black. Beneath, it is pale at the base with rufous spots, and undulated lines, and its apex is gray with a row of lunated black marks.

AMPHICOME; *ἀμφίκομη*, Gr. i. e. hairy on both sides; in natural history a kind of rugged figured stone, celebrated for its use in divination. It is also called Erotylos, *Ἐρωτύλος*, Amatoria, and is mentioned by Democritus and Pliny. Mercator considers it the same with the lapis lumbricatus, of which he gives a figure.

AMPHICTYON, the son of Deucalion, or as others say, of Helenus, the supposed institutor of the council of the Amphictyons. See next article.

AMPHICTYONS, in Grecian antiquity, an assembly composed of deputies from the different states of Greece; and resembling, in some measure, the diet of the German empire, or the late states general of the United Provinces. Some suppose the word *Ἀμφικτίονες* to be formed of *ἀμφὶ*, about, and *κτίειν* or *κτίζειν*, to dwell, because the inhabitants of the country round about met here in council; others, from Amphictyon, son of Deucalion, whom they suppose to have been the founder of this assembly; others again will have Acrisius, king of the Argives, to have been the first who gave a form and laws to it.—Authors give different accounts of the number of the Amphictyons, as well as of the states who were entitled to have their representatives in this council. According to Strabo, Harpocration, and Suidas, they were twelve from their first institution, sent by the following cities and states; the Ionians, Dorians, Perrhæbians, Bœotians, Magnesians, Achæans, Phthians, Melians, Dolopians, Ænianians, Delphians, and Phocians. Æschines reckons no more than eleven; instead of the Achæans, Ænianians, Delphians, and Dolopians, he only gave the Thessalians, Oetians, and Locrians. Lastly, Pausanias's list contains only ten, viz. the Ionians, Dolopians, Thessalians, Ænianians, Magnesians, Melians, Phthians, Dorians, Phocians and Locrians. In the time of Philip of Macedon, the Phocians were excluded the alliance for having plundered the Delphian temple, and the Lacedæmonians were admitted in their place; but the Phocians, sixty years after, having behaved gallantly against Brennus and his Gauls, were restored to their seat in the Amphictyonic council. Under Augustus, the city of Nicopolis was admitted into the body and to make room for it, the Magnesians, Melians, Phthians, and Ænianians, who till then had distinct voices, were ordered to be numbered with the Thessalians, and to have only one common representative. Strabo speaks as if this council were extinct in the times of Augustus and Tiberius: but Pausanias, who lived many years after, under Antoninus Pius, assures us it remained entire in his time, and that the number of Amphictyons was then thirty. The members were of two kinds. Each city sent two deputies, under different denominations; one called *ἱερομνήμων*, hieromnemon, whose business seems to have been more immediately to inspect what related to sacrifices and the ceremonies of religion; the other *πυλαγόρας*, pylagoras, charged with hearing and deciding of causes and differences between private persons. Both had an equal right to deliberate and vote in all that related to the common interests of Greece. The hieromnemon was elected by lot; the pylagoras by plurality of voices. Though the Amphictyons were first instituted at Thermopylæ, M. de Valois maintains that their first place of meeting was at Delphi; where, for some ages, the tranquillity of the times found them no other employment than that of being guardians of the temple of Apollo. In after-times the approach of armies frequently drove them to Thermopylæ, where they took their station, to be near at hand to oppose the enemy's progress, and to order timely succour to the cities in danger. Their ordinary residence however was at Delphi. Here they decided all public differences and disputes between any of the cities of Greece; and before they entered on business, jointly sacrificed an ox cut into small pieces, as a symbol of their union. Their final determinations were received with the greatest veneration by all their constituents. At their admission the Amphictyons took a solemn oath never to divest any city of their right of deputation; never to avert its running waters; and to make war against them if any attempts of this kind were made by others: more particularly, in case of any attempt to rob the temple of any of its ornaments, that they would employ hands, feet, tongue, and their whole powers, to revenge it. This oath was enforced by terrible imprecations against such as should violate it: e. g. may they meet the vengeance of Apollo, of Diana, and of Minerva; may their soil produce no fruit, their wives produce monsters, their adversary prevail in every law-suit; may they be conquered in war, their houses be demolished, and themselves and their children delivered to the ravages of the sword. The form of this oath was, according to Æschines, settled by Solon. The stated times of their meeting was in spring and autumn; the former being called *ἐαρινὴ πυλαία*, earine pylaia, and the latter *μετωπωρινὴ*, metoporine. On extraordinary occasions, however, they met at any time of the year, or even continued sitting all the year round. Philip of Macedon usurped the right of presiding in the assembly of the Amphictyons, and of first consulting the oracle, which was called *προμαντεία*, promanteia. The Romans never suppressed their meetings.

AMPHIDÆUM, *ἀμφιδαιον*, Gr. in anatomy, the orifice of the womb.

AMPHIDIARTHROSIS, in anatomy, an articulation of the lower jaw, partly by a ginglymus, and partly by an arthrodia.

AMPHIDROMIA; from *ἀμφὶ*, and *δρομος*, i. e. a double course; a feast celebrated by the ancients on the fifth day after the birth of a child, when it was carried round the fire and presented to the household gods.

AMPHIDRYON, in ancient churches, a curtain or veil drawn usually before the Bema, which see.

AMPHIJENE, in mineralogy, a species of garnet.

AMPHILA, Bay of, a bay in the Red Sea, on the eastern coast of Abyssinia, extending sixteen miles along the shore, and nearly twelve miles in depth. It contains thirteen small islands, composed of marine alluvies, strongly cemented together, and formed into a solid mass, resembling rock, covered in a few places only with a thin layer of soil. They have no inhabitants, but contain camels, goats, kids, and other animals, and are sometimes visited by fishermen. The shores to windward are steep, and often difficult of approach; those to leeward contain groves of rack trees, and are easy of access.

AMPHILOCHI, the people of Amphilochia. See next article.

AMPHILOCHIA, or Amphilochium, in ancient geography: 1. The territory of the city of Argos, Amphilochium in Acarnania; called Amphilochi, from the people, in the lower age. 2. A town of Spain, in Gallicia, built by Teucer, and denominated from Amphilochus, one of his companions: now called Orense.

AMPHILOCHIUS, bishop of Iconium, in the fourth century, the intimate friend of St. Gregory Nazianzen and St. Basil. He assisted at the first general council of Constantinople in 381, and presided at the council of Sidæ. Being desirous of suppressing Arian assemblies, and finding the emperor Theodosius unwilling to comply with his wishes, he adopted the following expedient: Whilst in the palace with other bishops, who were paying their respects to Theodosius, he took no notice of his son Arcadius, who had lately been declared Augustus. When the emperor reminded him of this seeming disrespect, Amphilochius said, that he had paid respect to him, and that was sufficient. The emperor was displeased, and said, that a slight put upon his son was an indignity to himself. 'You are angry,' replied Amphilochius, 'with those who slight *your* son, and cannot endure it; persuade yourself then, that the God of the whole world is offended with those who blaspheme *his* only-begotten Son, and hates them as ungrateful to their Saviour and Benefactor.' This produced the wished-for effect; and Theodosius soon afterwards, A. D. 385, forbade the assemblies of heretics. He died A. D. 394; and his works were published in Greek and Latin at Paris, in 1664, by Francis Combesis.

AMPHILOCHUS, son of Amphiaraus and Eriphyle, was a celebrated diviner. An altar was erected to him at Athens, and an oracle at Mallus in Cilicia, which city was founded by him in conjunction with Mopsus. The answers of this oracle were given by dreams; the party enquiring passing a night in the temple, and that night's dream was the answer!

AMPHIMACER; from *ἀμφὶ*, both, and *μακρὸς*, long, in ancient poetry, a foot consisting of three syllables, whereof the first and last are long, and the middle one short, such as the word ōmnĭūm.

AMPHIMALLUM; from *ἀμφὶ* and *μαλλος*, a fleece of wool; among ecclesiastical writers a covering or garment worn by the priests; but according to Magri, peculiar to the bishops. It was also called Amphibalum and Amphibolum.

AMPHIMASCHALI; *ἀμφιμάσχαλοι*; in antiquity, a name given to coats with two sleeves, worn by none but freemen; and distinguished from the *ἑτερομασάχαλοι*, or coats with one sleeve only; the peculiar dress of slaves.

AMPHIMERINA Febris, in medicine, a tertian remittent fever.

AMPHIMONE, in entomology, a species of phalæna, of the bombyx family. The wings are entire, of a pale ash colour, with two black streaks, and a fulvous dot in the middle of the anterior pair. It inhabits Terra del Fuego. The antennæ are greatly pectinated, body hairy, two yellowish lines on the thorax, abdomen with black belts, a single straight streak on the posterior wings beneath.

AMPHINOME, in entomology, a species of papilio, with indented wings, above black, clouded with numerous blue marks: an oblique white bar across the anterior wings; beneath, the lower wings radiated with red. It is a native of South America.

AMPHINOMUS, and his brother Arapius, called by Ælian *Φιλονομος* and *Καλλιας*, were surnamed Pii Fratres, because they carried their father and mother on their shoulders through the flames which arose from an eruption of Ætna. They received divine honours after their death.

AMPHION, in mythology, the son of Jupiter and Antiope; who, according to the poets, made the rocks follow his music; and, at his harp, the stones of Thebes danced into walls and formed a regular city.

Saxa Cythæronis Thebas agitata per artem
Sponte sua in muri membra coisse ferunt.—
Propert. l. 3. eleg. 2.

Amphion, in entomology, a species of hesperia, with wings entire, blue, and margins black: beneath cinereous, with black ocellated spots; posterior wings, with red lunated marks, black points, and golden characters. It is a native of Germany.

AMPHIPHOREUS; from *ἀμφὶ* and *φέρω*, to carry; in antiquity, a vessel with two handles. See Amphora.

AMPHIPLEX, in anatomy, the part between the seratum and the anus.

AMPHIPNEUMA, in medicine, the Dispnœa.

AMPHIPOLES; from *ἀμφὶ*, and *πόλις*, a city; in antiquity, the principal magistrates of Syracuse, who were established by Timoleon in the 109th Olympiad, after the expulsion of the tyrant Dionysius. They governed Syracuse for above 300 years; and Diodorus Siculus informs us that they existed in his time.

AMPHIPOLIS, a city of Macedonia, an Athenian colony, on the Strymon, but on which side of the river is not certain: Pliny places it in Macedonia, and Scylax in Thrace. The name of the town Amphipolis, however, seems to reconcile the difference; Thucydides observes, it was washed on both sides by the Strymon, which dividing itself into two streams, the city stood in the middle, and on the side towards the sea there was a wall built from channel to channel. It was considered to belong to the Athenians; and Philip of Macedon, when he had taken it, promised to restore it to them, though he afterwards obtained possession of it by treaty. Its ancient name was *Ἐννέα ὁδοὶ*, the Nine Ways. It was afterwards called Christipolis; now Chrisopoli, or Chisopoli.

AMPHIPOLIS, a town of Syria, on the Euphrates, built or renewed by Seleucus, and called by the Syrians Turmeda, and the same with Thapsacus.

AMPHIPPI; from *ἀμφὶ*, and *ἵππος*, a horse, in Grecian antiquity, soldiers who, in war, used two horses, without saddles, and were dexterous enough to leap from one to the other. *Hom. Od.* xv. v. 684.

AMPHIPRORÆ; from *ἀμφὶ*, and *πρώρα*, a prow; in the naval affairs of the ancients, vessels with a prow at each end, used chiefly in rapid rivers and narrow channels, where it was not easy to tack about.

AMPHIPROSTYLE; from *ἀμφὶ*, about, *προ*, before; and *τὐλος*, a column; in the architecture of the ancients, a house or temple which had a piazza in front and also behind.

AMPHISBÆNA AQUATICA, in entomology, a name given by Bertrutius, Albertus, &c. to the seta aquatica, and vermis setarius. It derives its name amphisbæna, from its going backwards or forwards with equal ease and celerity. The usual size is four or five inches long, and the thickness of a large hair. It seems to be bred in the common black beetle.

AMPHISBÆNA from; *ἀμφὶ*, both, and *βαίνω*, to go; in zoology, a genus of serpents belonging to the order of amphibia serpentes, so called on account of the shape of its body, which is of equal thickness from head to tail. They are consequently difficult to distinguish. This occasioned the notion of its having two heads. There are but two species, viz. 1. A. alba, is totally white, a native of both the Indies, and generally found in ant-hillocks. 2. A. fuliginosa, is found in Libya and in different parts of America. The bite of the amphisbæna is reckoned mortal by many authors; but it is not furnished with dog-fangs, the usual instrument of serpents for conveying poison. They feed upon ants and earth-worms, but particularly the latter.

AMPHISCII, Lat. *ἀμφίσκιοι*; of *ἀμφὶ*, and *σκιὰ*, a shadow; the inhabitants of climates wherein the shadows, at different times of the year, fall both ways; as in the torrid zone.

AMPHISMELA, or AMPHISMILA; from *ἀμφὶ*, on both sides, and *σμιλη*, a knife; an anatomical instrument, sharp on both sides, used in dissections.

AMPHISSA, in ancient geography, the capital of the Locri Oxolæ, 120 stadia, or 15 miles, to the west of Delphi; so called, because surrounded on both sides by mountains. On the summit of a hill near the town was a temple dedicated to Minerva, with her statue in bronze. Amphissa was taken and destroyed by the Phocians in the holy war.—Also a town of Magna Græcia, at the mouth of the Sagra, on the coast of the Farther Calabria, situated between Locris and Caulona; now called Rocelia.

AMPHISSÆI, or AMPHISSII, the inhabitants of Amphissa, who plundered the temple of Delphos.

AMPHITANE, among ancient naturalists, a stone said to attract gold as loadstone does iron. According to Pliny it was found in that part of the Indies where native gold lay so near the surface of the earth as to be turned up in masses. His description plainly points out the well-known fossil, called, by Dr. Hill, pericubium, and by others tincal.

AMPHITAPÆ, in antiquity, a kind of carpets, or clothing, having a soft warm nap on each side, on which persons slept.

AMPHITHALAMUS, in antiquity; from *ἀμφὶ* and *θάλαμος*, the marriage-bed; the maid-servant's room on both sides that of her mistress.

AMPHITHEATRE; from *ἀμφιθέατρον*; *ἀμφὶ*, around, and *θεάομαι*, to see. The ancient theatres were constructed in the shape of a parabola of a cone, or nearly semicircular, and an amphitheatre consisted of two theatres joined together.

> The *amphitheatre* begun by Vespasian, but finished and dedicated by Titus, was one of the most famous; the height whereof was such, that the eye of man could hardly reach it. *Hakewill's Apologie.*

> He [Theseus] first enclosed for lists a level ground,
> The whole circumference a mile around;
> The form was circular; and all without
> A trench was sunk, to moat the place about.
> Within, an *amphitheatre* appear'd
> Raised in degrees, to sixty paces rear'd
> That when a man was placed in one degree,
> Height was allow'd above for him to see.
> *Dryden's Palamon and Arcite.*

> Conceive a man placed in the burning iron chair at Lyons, amid the insults and mockeries of a crowded *amphitheatre*, and still keeping his seat; or stretched upon a grate of iron, over coals of fire, and breathing out his soul among the exquisite sufferings of such a tedious execution, rather than renounce his religion, or blaspheme his Saviour. *Addison.*

AMPHITHEATRES, in antiquity, were at first built only of wood; and it was not till the reign of Augustus, that Statilius Taurus built one, for the first time, of stone. The lowest part was of an oval figure, and called the arena, because, for the conveniency of the combatants, it was usually strewed with sand; and round the arena were vaults styled caveæ, in which were confined the wild beasts appointed for the shows. Above the caveæ was erected a large circular peristyle, or podium, adorned with columns. This was the place of the emperors, senators, and other persons of distinction. The rows of benches were above the podium. Their figure was circular: and they were entered by avenues, at the end of which were gates called vomitoreæ. Their theatre was built in form of

a semicircle only exceeding a just semicircle by one-fourth part of the diameter; and the amphitheatre was nothing else but a double theatre, or two theatres joined together; so that the longest diameter of the amphitheatre was to the shortest as 1½ to 1. There are amphitheatres still standing at Rome, at Pola, at Nismes, &c. The amphitheatre of Vespasian, called the Coliseum, and that of Verona in Italy, are the most celebrated now remaining of all antiquity. Remains of amphitheatres are shown also at Arles, Bourdeaux, &c. The amphitheatre at Pola, an ancient republic of Istria, is very entire: it consists of two orders of Tuscan pillars, one over the other. The lower have pedestals, which is extraordinary; this order having scarce ever more than bases to support them. The amphitheatre of Vespasian is the largest, but that of Verona the best preserved: for though most of the best stones of the outside are picked out, yet the great vault, on which the rows of the seats are laid, is entire; the rows also (which are forty-four in number) are entire. Every row is a foot and a half high, and as much in breadth; so that a man sits conveniently in them; and, allowing for a seat a foot and a half, the whole will hold 23,000 persons. Pliny mentions an amphitheatre built by Curio, which turned on large iron pivots; so that of the same amphitheatre two several theatres were occasionally made, whereon different entertainments were sometimes presented at the same time. Mr. Brydone (vol. i. 295) mentions an amphitheatre at Syracuse, the theatre of which is so entire, that the gradini for seats still remain; but it is small, he says, in comparison of the others.

The podium in these erections was fenced with iron spikes, &c. to prevent the hunted animals from leaping over. Attention was paid to order of rank in the distribution of seats; married men had seats distinct from those that were unmarried, and youths of respectability sat with their tutors. The upper galleries, being considered inferior places, were occupied by plebeians, who stood behind the women. The amphitheatres, being open buildings, were exposed to considerable inconvenience occasionally, by the changes of the elements, and were furnished with various inventions to meet them. Down the edges of the benches adjoining the stairs, channels were cut to drain off the rain-water, which communicated with ample drainage-pipes below; an awning, or canopy, which would protect the whole circumference of the building, was drawn at convenience over the heads of the spectators, and fountains refreshed the air with the aromatics of the east. On some occasions we read of the whole furniture of the amphitheatre dazzling the eye, with ornaments of gold, silver, or amber: and the net-work in front of the podium, in the time of Carinus, is said to have been formed of gold wire. To these luxuriant innovations in the manner of conducting the public amusements, we find the poets frequently allude. Thus Ovid,

Tunc neque marmoreo pendebant vela theatro,
Nec fuerant liquido pulpita rubra croco;
Illic quas tulerant, nemorosa Palatia, frondes
Simpliciter positæ: scena sine arte fuit.
In gradibus sedit populus de cespite factis,
Qualibet hirsutas fronde tegente comas.

The cunei, compartments or sets of seats, were under the protection of officers called the locarii; and the building was placed under the general superintendance of a villicus amphitheatri. Artificial forests were also planted in the midst of the circus; and mountains and caves which appeared to abound with the wild inhabitants of the deserts of Africa and the east. In these thousands of beasts have on some occasions been introduced and slain. Afterwards the centre of the amphitheatre was sometimes suddenly converted into an immense basin of water, and sea-fights exhibited on a considerable scale.

A. U. 490 is the period celebrated for the introduction of gladiatorial combats, which were first exhibited by M. and D. Brutus on the decease of their father. The practice of hunting wild animals in the amphitheatre was introduced in A. U. 502, as Pliny says, to inure the Romans to despise the elephants of the Carthaginian and Asiatic armies. The elephants taken in the first Punic war from the Carthaginians are said to afford the earliest instance of wild beasts being brought into the forum. Pliny considers the first exhibition to have been those taken in Sicily by Metellus.

According to Homer, Iliad lib. xxiii., it had long been customary to sacrifice their enemies to the manes of great men, and to immolate slaves at their funerals; but it was for the Romans to exhibit the combats by which this was effected, as a public sport. Immediately upon its introduction, the spectacle became the favourite of the people; the heir of every considerable estate was expected to indulge the citizens with a tragedy of this description; and the candidates for office found no readier mode of obtaining the public favour.

The introduction of the first regular amphitheatres as the scene of these sports, is attributed to Julius Cæsar, or his friend Caius Curio. A singular contrivance in the exhibition of the games at the death of Curio's father, suggested the oblong shape which amphitheatres ever afterwards retained; whilst the Theatrum Venatorium, or hunting theatre, which Cæsar erected at the dedication of the forum, is the first building known to have been distinguished by the name of amphitheatre. Curio on the occasion alluded to, having entertained the people with dramatic representations until noon in two of the ordinary theatres, which, although semicircular, exceeded a semicircle by one-fourth of the diameter, suddenly caused them both to be wheeled round without disturbing the spectators, and exhibited the gladiatorial combats between them. All the early amphitheatres, after this circumstance, assumed the shape of two of the ancient theatres joined in front. Improvements were made upon the newly-invented plan: a building which passed by this name, partly built of stone, is ascribed, as we have seen, to Statilius, one of the courtiers of Augustus; and the emperor himself is said to have projected a still more permanent erection

on the site afterwards occupied by the Coliseum. During the reign of Tiberius we read of a theatre constructed by Atilius, at Fedena, a short distance from the city, which would contain from 50,000 to 60,000 persons. This amphitheatre, overcrowded on a particular occasion, fell to pieces, and maimed a great majority of the spectators. Suetonius says that 20,000 persons perished by the accident; and the circumstance seems to have given rise to a decree of the senate, that for the future no man who was not worth 400,000 sesterces, should presume to exhibit gladiators to the public. These erections, generally of timber, are scarcely, however, to be regarded as more than an ingenious scaffolding for the public accommodation, until under the auspices of Vespasian and Titus, the Roman architecture united with the imperial magnificence to produce that stupendous monument of fallen greatness, the Coliseum. This celebrated building called by some writers the Flavian amphitheatre, from its immense size and magnificent appearance, forms the most stupendous monument of ancient Rome. Embosomed in the heart of the city, it towered above every other object. Modern authors speak of it as one of the most sublime exhibitions of majesty in ruins in architecture, far exceeding the pyramids of Egypt and all the wonders of the ancient world. Ammianus speaks of it as a solid mass of masonry, whose summit the eye can hardly reach. According to Eutropius, 5000 beasts, and according to Dio even 9000, at its dedication were sacrificed in the area. It has been calculated that 10,779 wild beasts of the description usually exhibited there, might stand within its limits. Suetonius says 5000 were actually exhibited there by Titus in one day. The circumference of this fabric measured 1770 feet, including a superficial area of 246,661, being something more than four acres and a half of land. Its extreme height was 164 feet, and the exterior elevation is said to have been composed of three stories of arcades, exhibiting successively the Doric, Ionic, and Corinthian orders. The longer diameter was 615½ English feet, and the shorter 510. The accommodation of the spectators occupied a width of 157 feet, leaving for the larger diameter of the arena 281, and for the shorter 176, allowing twenty feet for the walls, &c. of the building. The first or ground-floor was elevated three feet and a half, and from this to the top of the cornice of the column was thirty-three feet and a half. The second story was thirty-nine feet high; the third, thirty-eight; and the Corinthian pilastrade, which crowned the whole at the top, about forty-six feet. The exterior walls were of Travertine stones cramped together with iron and without cement. The piers and arches were of brick, mixed with the same kind of stone; whilst various kinds of stucco and marble facings adorned the inner front. Many seats of the podium were of marble, decorated with magnificent cushions and drapery. The vomitories, which opened into the area of the building, were sixty-four. Lipsius tells us, that there were seats in the interior capable of containing 87,000 people, and that the galleries above, with the spacious passages and platforms, held from 25,000 to 30,000 more. The erection of this edifice commenced in the eighth consulate of Vespasian, and was completed by Titus within the space of three years. All the upper works of the interior were of wood, since we read of a fire that destroyed them in the year A. D. 219; and of another which did considerable damage in the reign of Decius.

For upwards of three centuries human blood flowed in the Coliseum, mingled with that of almost every beast in the forest; and here many of the primitive martyrs suffered. Constantine on his conversion put down all gladiatorial exhibitions; and in the reign of Honorius was abolished the profession of gladiator. The hunting of wild beasts in the arena was continued, though not upon its former scale of magnificence, and the seats of distinguished families were preserved as late as the sixth century. Tilts and tournaments were held in most of the amphitheatres during the middle ages; but the ruined grandeur of the Coliseum, as it now stands, is the principal surviving link between ancient and modern Rome. 'While stands the Coliseum, Rome shall stand, is the language of a modern poet, quoted from the venerable Bede, who relates, 'Quamdiu stabit Colysæus, stabit Roma; quando cadet Colysæus, cadet et Roma; quando cadet Roma, cadet et mundus;' as a saying of the Anglo-Saxon pilgrims, who visited Rome in the eighth century, and considered the Coliseum the most remarkable memorial of her grandeur and barbarity.

In the time of Justinian this edifice began to feel the effects of time, and was considerably damaged by the earthquakes and floods of the seventh century. About the thirteenth century privileges were granted to the different factions to dig out stones from the Coliseum, as a kind of quarry.

From the twelfth century, the excavated walls had been occasionally fortified, and it furnished a frequent retreat to the popes. In 1312 we find it as a regular fortress, surrendered to the emperor Henry VII.; and ten years afterwards, it was formally 'declared to be the property of the Roman senate and people.' At this time a celebrated bull-feast, mentioned by Gibbon, was held within this noble ruin; several orders of benches were restored, and a general invitation circulated throughout Italy to invite the nobles to join in the gallant sport. A writer, nearly contemporary with the scene, Lud. Buon. Monaldesco, has given a very interesting sketch of the devices and adventures of the knights, and the families and pretensions of the Roman ladies who crowded to the exhibition.

The porticoes on the south side, and towards the arch of Constantine, are supposed to have been overthrown in the earthquake of 1349. In 1381 a third part of the building, and a jurisdiction over the whole, was granted by the senate and people to the society of Sancta Sanctorum, who formed an hospital within it, and exercised their rights to the year 1510. Their arms, which are still seen on what are now exterior arcades towards the church of St. Gregory, demonstrate that the outer circles had fallen down at the time of their occupation of the building; and, therefore, that 'the whole exterior circumference

could not be 'entire and inviolate,' as stated by Mr. Gibbon, to the middle of the sixteenth century. Some of the finest buildings of modern Rome are said to have been constructed out of a small part of these magnificent ruins; in 1531 portions of the stones were exposed to public sale; but 'all lesser plunder has been obliterated,' says Mr. Hobhouse (in his celebrated Historical Illustrations of the Fourth Canto of Lord Byron's Childe Harold), 'by the more splendid rapine of the Farnese princes.' The baths of Constantine, the forum of Trajan, the arch of Titus, the temple of Antoninus and Faustina, the theatre of Marcellus, added their marbles to the spoils of the Coliseum; and the accounts of the Apostolic chamber record a sum of 7,317,888 crowns expended between the years 1541 and 1549, upon the gigantic palace of Campo di Fiore alone.

Pope Sixtus V. according to Fontana, advanced 15,000 crowns to the merchants of Rome, to establish a woollen manufactory here; but the project was relinquished. In 1594 it was partly occupied by mechanics; and 'this majestic relic,' continues the above writer, 'which had been protected as a barrack, a hospital, and a bazaar, and which more enlightened ages considered only as a convenient quarry, seems never to have been estimated in its true character, nor preserved as the noblest monument of imperial Rome, until a very late period.'

Marangoni, a Romish canon, who composed a work entitled Delle Memorie Sacre e Profane dell' Anfiteatro Flavio dal Canonico, in the middle of the last century, gives us an account of numerous martyrs whom the faith of the Catholic church has assigned to this spot. Here, besides the memorable triumph of four females over the lions of the amphitheatre (who refused, he declares, to touch them), we have an account of the temptations of St. Philip Neri by the devil, who appeared to him in the Coliseum in the shape of a naked woman; Pius V. used to speak of the earth of the arena being cemented with holy blood; and a modern cardinal (Uderic Carpegna) is said always to have stopped his coach opposite to the ruins, and to repeat over the names of all the martyrs who had suffered there, before he would proceed. The Passion of our Saviour, the resurrection, and various other pious farces ('sacra farsa,' says a Catholic historian), were sometimes performed here from the close of the fifteenth century to the pontificate of Paul III.; and at about the former date a small church, which, with its adjacent hermitage, is still to be seen within the ruins, was consecrated by a bishop of Grossetto. Clement X. in the jubilee of 1675, solemnly set apart this building as a monument to the martyrs. The following, according to Mr. Hobhouse, is one of the inscriptions of that period, which still appears:

Amphitheatrum Flavium
Non tam operis mole et artificio ac veterum
Spectaculorum memoria
Quam Sacro Innumerabilium Martyrum
Cruore illustre
Venerabundus hospes ingredere
Et in Augusto magnitudinis Romanæ monumento
Execrata Cæsarum sævitia
Heroes Fortitudinis Christianæ suspice
Et exora
Anno Jubilæi. MDCLXXV.

The arcades were now carefully blocked up from the public; and in 1727 a petition was presented to the reigning pontiff to permit the solitary hermit who had charge of the buildings, 'to let out the grass which grew in the arena.' In 1742, after an attempt to assassinate the hermit, it was consecrated anew by Lambertini, and several severe edicts were published, forbidding its spoliation. Pius VII. has added some solid buttresses to the tottering walls at a considerable expense, and sentinels now protect the ruin; but our countrymen who have lately visited it, predict its speedy dissolution.

The other amphitheatres of the ancient world, were all more or less modelled upon the plan of the Coliseum; but those of Verona, Capua, Nismes, and Autun, alone approached the amphitheatre of the capital in the style of their decorations. That of Verona measured 506 English feet in the longer diameter, in the shorter, 405 feet; and the arena was 247 feet long by 145 wide—the whole building including a circuit of 1,451 feet, and a superficial area of 204,930 feet; equal to about four-fifths of the size of the Coliseum itself. Its entire height, consisting of three stories of arcades, was about 90 English feet. The amphitheatre at Nismes was 430 English feet long; by 338 wide, including an area of nearly three acres; here were two stories of arcades, reaching to about 65 feet in height. Its history forms, to this day, one of the most extensive monuments of Roman antiquity in all France. Other buildings of this description, as at Pola in Istria, at Pœstum in Lucania, and at Italica in Spain, enclosed one, two, and three acres of ground; and sometimes the sides of adjacent hills were seated, and adapted to the purposes in question: as at Corinth, and Gortina in Candia. Vestiges of amphitheatres, on a smaller scale, are found at Alba; at Otricoli in Umbria; at Puzzuoli; at Syracuse, Agrigentum, and Catania in Sicily; and at Sandwich in Kent, and Caerleon in Monmouthshire.

AMPHITHURA, in ecclesiastical antiquity, the vail which divided the chancel from the rest of the church; so called because it opened in the middle like folding doors.

AMPHITRITE; *ἀμφιτρίτη*, from *ἀμφί*, and *τρίζω*, to sound; in heathen mythology, the daughter of Ocean and Thetis, the wife of Neptune and the goddess of the sea; sometimes used in poetical language for the sea.

AMPHITRITE, in natural history, a genus of animals of the class vermes, order mollusca. Generic character: body annulate; peduncles small; feelers two; eyes none. The species of this genus are reniformis, pencillus, ventilabrum, auricoma, cristata, chrysocephala, and plumosa.

AMPHITRYON, the son of Alcæus, from whom Hercules derived his name Alcides, more distinguished by the amour of Jupiter with his wife Alcmena, than by any exploits of his own. See ALCMENA.

AMPHODONTA; from *ἀμφί*, and *ὀδούς*, a

tooth; in zoology, an appellation given to animals which have teeth both in the upper and under jaw.

AMPHORA, in antiquity, a liquid measure among the Greeks and Romans. The Roman amphora contained forty-eight sextaries, equal to about seven gallons one pint English wine measure; and the Grecian or Attic amphora contained about one-third more. The amphora is represented on the coins of Athens, of which city it is supposed to be symbolical, as in the annexed diagram, representing Jupiter Fulgurator, the darter of lightning; the inscription is ΑΘΕ, i. e. *Ἀθηναίων*, Atheniensium. It is called by Homer amphiphoræus, and by contraction amphorus, on account of its having two handles. Amphora was also a dry measure used by the Romans, containing about three bushels.

AMPHORA, in Venice, is the largest measure used for liquids, containing about sixteen quarts. As a wine measure it contains four bigoncia, and a bigoncia contains four quantari, 116 secchie, or 256lbs. peso groso.

AMPHORARIUM VINUM, in antiquity, wine preserved or used in amphoræ or pitchers; by way of distinction from vinum doliare, or cask wine. The Romans had a method of keeping wine in amphoræ for many years to ripen, by fastening the lids tight down with pitch or gypsum, and placing them either within the reach of smoke or under ground.

AMPHORARIUS, in antiquity; from *ἀμφορα*, a cup, or tankard bearer.

AMPHORITES, in antiquity, a sort of literary contest in Ægina, wherein an ox was the prize bestowed upon the writer who produced the best dithyrambic verses in commendation of Bacchus.

AMPHOTIDES, in antiquity, a kind of armour or covering for the ears, and, as some say, the nose, worn by the ancient pugilists, to prevent their adversaries from laying hold of that part.

AMPHRYSUS, or AMPHRYSSUS, in ancient geography, 1. A river of Phthiotis, in Thessaly, running by the foot of mount Othrys, into the Enipeus at Thebes in Thessaly. 2. Another in Phrygia, which, according to Pliny, rendered women barren. 3. A town of Phocis, at the foot of mount Parnassus, encompassed with a double wall by the Thebans, in the war with Philip.

AMPIA LABIENA LEX, in ancient history, a law which gave Pompey the Great the privilege of appearing at the Circensian games in triumphal robes and a golden crown, and with a prætexta and golden crown at the theatres. It was enacted by Ampius and Labienus, then tribunes of the people. A. U. C. 693.

AMPLA, in conchology, a species of voluta. The generic characters are, that the shell is elongated, the aperture large, the lip acute, and the wreaths of the spire scarcely visible.

AM'PLE,
AM'PLENESS,
AM'PLIATE,
AMPLIA'TION,
AM'PLITUDE,
AM'PLY,
AM'PLIFY,
AM'PLIFIER,
AMPLIFICA'TION.

Lat. *Amplus*, large in quantity, or extent. Spread out, expanded, as a small quantity of gold in bullion may be beaten out into laminæ or leaves to a great extent; spacious; capacious.

He [Daniel] expresseth the frute of ye kyngs repentance, that is to wete, God to geue miche more *ample* giftis to the repentãt then he toke from them, as ye see him to haue done to Job.

The Exposicion of Daniel by George Joye, c. iv.

And underneath his feet was written thus,
Unto the victor of the gods this be:
And all the people in that *ample* hous
Did to that image bowe their humble knee,
And oft committed fowle idolatrie.

Spenser's Faerie Queene, b. iii. c. 11.

As for the cathedral of Lincoln, whose floor is higher than the roof of many churches, it is a magnificent structure, proportionable to the *amplitude* of the diocese. *Fuller's Worthies. Lincolnshire.*

If you will tarry, holy pilgrim, but till the troops come by,
I will conduct you where you shall be lodg'd,
The rather, for I think I know your hostess
As *ample* as myself.

Shakspeare's All's Well that ends Well, act iii. sc. v.

As new waked from soundest sleep,
Soft on the flow'ry herb I found me laid,
Straight toward heav'n my wandering eyes turned I,
And gazed awhile the *ample* sky. *Milton.*

Now let us leave this world, and lift our eye
To the large convex of yon azure sky;
Behold it like an *ample* curtain spread,
Now streak'd and glowing with the morning-red,
Anon at noon in flaming yellow bright,
And chusing sable for the peaceful night.

Prior's Solomon, b. I.

———Say, proud arch,
Built with divine ambition; in disdain
Of limit built; built in the taste of heav'n.
Vast concave! *ample* dome! wast thou design'd
A meet apartment for the Deity?
Not so: that thought alone thy state impairs:
Thy lofty sinks and shallows thy profound,
And straitens thy diffusive. *Young's Nt. Thoughts.*
The great Creator! Him! who now sublime,
Wrapt in the solitary *amplitude*
Of boundless space above the rolling spheres,
Sits on his silent throne and meditates.

Kirke White's Poems.

AMPLEPUIS, a town of France, in the department of the Rhone, and arrondissement of Ville Franche, twelve miles east of Rouanne. A great quantity of linen is manufactured here and exported, and the place has a considerable inland trade. It is also celebrated for producing excellent wines. Population 3300.

AMPLIATION, in Roman antiquity, the deferring to pass sentence in certain causes; which was done by pronouncing the word amplius or writing the letters N. L. non liquet; thereby signifying that the cause was not clear.

AMPLIATOR, a title given to the emperor Antoninus Pius, on account of his having extended the jus civitatis, or right of citizenship to many states and people before excluded from that privilege.

AMPLIFICATION, in rhetoric, part of a discourse or speech, wherein a crime is aggravated, a praise or commendation heightened, or a narration enlarged, by an enumeration of circumstances; so as to excite the proper emotions in the minds of the auditors. Such is the passage of Virgil, where, instead of saying merely that Turnus died, he amplifies the circumstance of his death.

—Ast illi solvuntur frigore membra,
Vitaque cum gemitu fugit indignata sub umbras.

It has been divided into amplification by words, i. e. metaphors, hyperboles, &c. &c. amplification of things, as where a multiplication of causes, circumstances, &c. is introduced.

AMPLITUDE, in astronomy, an arch of the horizon intercepted between the east or west point, and the centre of the sun, or a planet, at its rising or setting; and so is either north and south or ortive and occasive. The amplitude of a heavenly body may be found trigonometrically by saying, as the cosine of the latitude, to radius, so is, the sine of the declination of the body, to the sine of its amplitude.

AMPOTIS, *ἀμποτις*, Gr. literally the ebb of the tide, but applied metaphorically by Hippocrates to the recess of humours from the circumference of the body to the internal parts.

AMPSAGA, in ancient geography, a river of Africa, separating Mauritania Cæsariensis from Numidia Propria.

AMPSANCTUS, or AMSANCTUS, a lake of the Hirpini, in Italy, celebrated for the mephitic odour which issues from it, now called Mufiti, from the god Mephitis, who had a temple there. Virgil (Æn. vii. 565) makes the Fury Alecto to descend down to hell by this lake; and Swinburne describes an oval pond, from which a sulphurous vapour issued in his time 'with a loud rumbling noise.'

AMPT, in Danish polity, a subdivision of districts in Denmark, over which a provincial governor is placed, called the amptsman, and stifts-amptsman. The latter is a post of considerable authority.

AMPTHILL, a town in Bedfordshire, pleasantly situated between two hills, fifteen miles from London, between the roads from thence to Buckingham and Royston. It is almost in the centre of the country, but in a barren soil. It has two fairs, May 4th and December 11th, and a weekly market on Thursday. It was for some time the residence of Catherine queen of Henry VIII. to whose memory the earl of Upper Ossory erected a Gothic cross in 1774, whose site is now occupied by an obelisk, containing a pump! The seat of the duke of Bedford, in this neighbourhood, was built by sir John Cornwall, in the reign of Henry VI. out of the spoils taken from the French. Near the entrance of the park, stood the celebrated pear-tree, under which, it is said, Sir Philip Sidney wrote his Arcadia.

AMPTITZ, AMTITZ, or AMPTLITZ, a market town, castle, and lordship, of Lower Lusatia in the circle of Guben, between the rivers Lubs, and Neisse. The lordship consists of seven villages, and contains fruitful corn and pasture fields, productive fisheries and forests, and a considerable quantity of iron ore. It is five miles south of Guben.

AMPUGNANO, a town and district of Corsica, containing 4140 inhabitants.

AMPUJIS, an old town and lordship of France, now included in the department of the Rhone, arrondissement of Lyons. It contains a castle and about 300 houses; the adjoining country produces excellent vines.

AMPULLA, among ecclesiastical writers, one of the sacred vessels used at the altar. It was also used for holding the oil in chrismation, consecration, coronation, &c. and frequently appears in the inventory of church furniture. This was also the name of an ancient drinking vessel.

The ampulla is still a distinguished vessel in the coronation of the kings of England and France. In the history of countries, miracles are alleged to be connected with these portions of the regalia. In France the holy oil was brought from heaven by a dove, sayeth the legends, 'no other doubtless than the Holy Spirit,' adds one historian, and it was renewed in the ampulla by a standing miracle until the revolution! On the late coronation of Charles X. the public papers stated, that a phial containing some of this invaluable unction had even survived that catastrophe.

Our English ampulla was said to have been originally received by Thomas à Beckett, well filled with oil from the Virgin Mary: The vessel now in use is an eagle with expanding wings standing on a pedestal, near seven inches in height, and weighing about ten ounces. It is of the purest chased gold; and passing through various hands to the Black Prince, was by him deposited in the Tower. Henry IV. being the first king anointed with it.

AMPULLA, in conchology, a species of bulla, found in the Indian seas.

AMPULLA, St., KNIGHTS OF, a ci-devant order of knighthood in France, instituted by Clovis I.

AMPURA, a province of the kingdom of Peru, before its conquest by the Spaniards: said to have been conquered by Virachoca the eighth inca.

AMPURDAN, a district of Spain, in Catalonia. It produces flax, but is in general a barren country.

AMPURIAS, a sea-port and walled town of Catalonia, in the district of Ampurdan, of which it is the capital. It stands near the mouth of the river Fluvia, sixty miles north-east of Barcelona. It was formerly a place of considerable note. In the neighbourhood is the Castello de Ampurias. Population 22,000.

AM'PUTATE, } *Amputo.* *am* from the
AMPUTA'TION. } Greek *ἀμφι*, and *puto*, to pare round; to cut off.

The Amazons, by the *amputation* of their right breast, had the freer use of their bow.

Brown's Vulgar Errours

Admitting the same doctrine of an original body we must, however, observe, that living men may lose several of their limbs by *amputation*.

Beattie's El. of Moral Science

Amongst the cruizers, it was complained, that their surgeons were too active in *amputating* fractured members. *Wiseman's Surgery.*

AMPUTATION. See SURGERY.

AMPYX, in antiquity, a kind of golden chain, which served to bind the hair of horses, and sometimes of men or women, on the forehead. Homer describes by this ornament the steeds of the god of war, calling them χρυσάμπυκες.

AMRAM; אמרם, Heb. i. e. a high people; the son of Kohath, and grandson of Levi; the father of Aaron, Moses, and Miriam. He died in Egypt, aged 137.

AMRAN, a town and fortress of Hindostan, with a district adjacent, situated in the Gujrat peninsula. Lat. 22° 35′ N., long. 70° 35′ E.

AMRAPHEL; אמרפל, Heb. i. e. a speaking destruction; the king of Shinar, or Babylonia. See Gen. xiv. 1.

AMRAS, or AMBRAS, once a strong castle of Germany, in the Tyrol; by some German writers called Arx Ambrosiana, and by others Ombras. It was long remarkable for its beautiful galleries, and an extensive collection of antiquities, a great part of which were sent to this place by Charles V.

AMRETSIR; i. e. the pool of Immortality; a town of Hindostan, in the province of Lahore, and forty miles south-east of the city of that name. It is the capital of the Seik nation. Lat. 31° 34′ N., long. 74° 25′ E. Some Seik authorities ascribe the foundation of this place to Gooroo Ram Dass, who died A. D. 1581, but it was known before his time, under the name of Chak. Gooroo Ram Dass added much to its population, and built the famous reservoir or tank, named Amretsir, which, in the course of time, became the name of the town. Amretsir is now about eight miles in circumference, and though the streets are narrow, the houses, in general, are lofty and built of burnt bricks. It is the grand emporium for the shawls and saffron of Cashmere, and various other commodities from the Deccan and eastern parts of India; hence it is the resort of opulent merchants, and contains several respectable banks. Its manufactures are a few coarse cloths and inferior silks. The sacred basin, to bathe in which is considered by the Seiks and many Hindoo tribes as a complete moral purification, is about 135 paces square, and built of burnt bricks. In the centre stands a temple, dedicated to Gooro Govind Singh, and within is lodged, under a silken canopy, the book of laws, written by that Gooroo. There are from 500 to 600 akalies, or priests, belonging to this place. This town is on the high-road between Cabul and Delhi.

AMRU-EBN-AL-AS, one of the most famous of the first race of Saracen leaders, was in the early part of life a zealous opponent of Mahommedanism, but became a zealous convert to that faith, and joined Mahomet, when a fugitive prophet at Medina. After several displays of his military valour, he rose to the station of chief in Irak; and during the caliphate of Omar served in Palestine. In A.D. 638 he took Cæsarea, and reduced to subjection all the maritime towns of Syria. Afterwards, attended only by 4000 Arabs, he took Pharma, or Pelusium, and besieged Misrah, the ancient Memphis, which he took by storm; and on its site erected the present Old Cairo. After this victory, the majority of Egyptian natives being Coptic Christians and enemies to the Catholic Greeks, submitted to Amru, and engaged to provide quarters and support for the Mussulman army. Amru pursued the Greeks to Alexandria, which, after a siege of fourteen months, he took, A.D. 640. Amru observed a wise and equitable policy in Egypt; and died in this government, A. D. 663.

AMSBURY, or AMBERSBURY. See AMESBURY.

AMSCHELBEORG, a market town of Bohemia, in the south-east part of the coast of Beraun, twenty-four miles south of Prague.

AMSDORFF (N.) educated as a Roman Catholic Priest, became a Protestant, and an associate of Luther. He is said to have broached the absurd doctrine that good works are prejudicial to salvation, and gave name to the AMSDORFIANS, an evanescent sect of the reformation.

AMSEGETES, in antiquity, those whose grounds abutted on the highway.

AMSTADTEN, a market town of Lower Austria, in the west quarter of the forest of Vienna, on the Lentz road. It has a post-office and iron works.

AMSTEL, a river of Holland, at the mouth of which Amsterdam is built. It enters the Zuyder Zee by the Wye arm.

AMSTELLAND, a district of Holland, in which stands the city of Amsterdam. It is bounded on the east by Gooeland, by Rhinland and Utrecht south, the lake of Haerlem west, and Waterland north.

AMSTELVEEN, a small town of Holland, near the Amstel, and six miles south of Amsterdam.

AMSTERDAM, a large populous and commercial city of Holland, formerly the capital of the United Provinces, and now of the kingdom of the Netherlands. This city is seated on the mouth of the Amstel, where it falls into an arm of the sea, called the Y, or Wye; sixty-five miles north of Antwerp, 175 east by north of London; 240 north by east of Paris, and 560 north-west of Vienna. Lon. 4° 44′ E., lat. 52° 25′ N. Amsterdam, being seated on a marshy soil, is built on piles of wood; and intersected throughout by numerous canals, which contribute both to its convenience and cleanliness. These canals are deep, the sides are lined with hewn stone, they have generally rows of trees planted on each side, and many stone-bridges over different parts of them. The finest is called the Ammarack, which is formed by the waters of the Amstel, into which the tide comes up, and on the sides of which are two large quays. This canal has several bridges. Next the sea is the Pont-Neuf, or new bridge, 600 feet long, and 70 broad, with iron balustrades on each side; it has thirty-six arches, of which eleven are very high, and eight are shut up to enclose yachts. From this bridge there is a most charming prospect of the city, port, and sea. The port is a mile and a half in length, and above 1000 paces

in breadth. The streets in general are well-paved, but narrow, and the houses built of brick or stone. The Heeren-gragt and Prissen-gragt contain some noble buildings. Towards the sides of the haven the city is enclosed with piles joined by large beams placed horizontally. There are openings to let the ships in and out, which are shut every night at the ringing of a bell. Outside of the piles lie the heavy laden ships, in what is called the Laag. The city occupies altogether an extent of 892 acres, and is 3,758 toises in circumference; or, according to another estimate, about 18,790 geometrical feet in the area, and nine and a half English miles round. The Amstel divides it into two parts, the Eastern or Old, and the Western or New Town.

In 1204 on the site of Amsterdam there was nothing but a small castle, called Amstel, (from the river,) which its lords made a retreat for fishermen, who lived in huts covered with thatch: in the fourteenth century it became considerable, had a bridge and towers built about it, and rose into a commercial town; though, till the year 1490, it was only surrounded with a weak palisado. The walls were then built with brick, to defend it from the incursions of the inhabitants of Utrecht: but some months afterwards it was nearly reduced to ashes. In 1522, being unsuccessfully besieged by the people of Guelderland, they set fire to the ships in the harbour; and in 1525 an Anabaptist leader, with six hundred of his followers, seized the city in the night-time, and took possession of the town-house, from which they were with difficulty dislodged. About ten years after, another tumult was raised here by fanatics, consisting of men and women, who ran about the streets naked, and endeavoured to make themselves masters of the town. Amsterdam was one of the last cities that embraced the reformed religion. It was attacked by the Hollanders in 1578, and submitted after a siege of ten months. One article of the capitulation was, a free exercise of the Roman Catholic religion; but this was not observed by the Protestants; who, still smarting under the persecutions of the Papists, adopted one of their worst principles, that of keeping no faith with heretics. They accordingly soon drove the ecclesiastics, monks, and nuns, out of the city, broke the images, and demolished the altars. From this time it became the general rendezvous of all nations, and quickly rose to its modern rank among the commercial cities of Europe. The stability of its trade was however finally fixed by the erection of the bank, instituted by the States of Holland in 1609, and which combining with the decline of Antwerp, through the shutting up of the Scheldt, rendered Amsterdam the grand central point of European commerce. In 1757 a number of buildings in the town were destroyed by the explosion of a powder magazine; and in 1787 this city surrendered, after some opposition, to the Prussians, who continued to occupy it until the following year. In 1795 it received the French with open arms, many of the inhabitants being at that time adverse to the house of Orange. It was ascertained at this period that the boasted treasures of the famous banking establishment were merely imaginary; the cash having been lent out by the directors to different public bodies, whose bonds were deposited in the bank in lieu thereof. From 1810 to the fall of Buonaparte, Amsterdam was the chief town of the French department of the Zuyder Zee, and the third in the French empire, taking rank after Paris and Rome. Its population amounted in 1785 to 230,000, but was reduced in 1812 below 200,000; the number of houses in the latter year was 26,000, exclusive of the suburbs. All the religions of Europe are tolerated in their respective professions here. There are eleven churches for the Dutch of the established or Calvinistic persuasion, with two French, and one High Dutch; also one English, one Scotch, one Arminian, two Lutheran, and three Baptist churches; no less than twenty-four Catholic chapels, and a Quaker meeting. The Jews divide themselves into two branches, the Portuguese and the German, who both possess splendid synagogues. Of the public commercial establishments, the principal are the arsenals and dock-yards; here is also an excellent public academy, and grammar school; an anatomical surgical college; work-house, house of correction or rasp-huis, an orphan-house, an hospital for aged men, and an establishment for widows, a lunatic asylum, botanic garden, &c. &c. on the most liberal foundations. There are likewise several literary societies in Amsterdam, which are supported with great spirit. The principal institution of this nature is the Felix Meritis, devoted to philosophy and the fine arts. It occupies a noble building, of which the music room has been much admired. The most splendid edifice in the whole of Holland, perhaps, is the stadthouse of Amsterdam. It stands nearly in the centre of the town, on an open square, and is said to have cost £300,000 sterling. It is built of freestone, with the exception of the ground floor, which is of brick. It is 282 feet long, 235 broad, and, without reckoning the tower, 116 high. It is built on a foundation of 13,659 piles, and has seven porticos representing originally the Seven United Provinces; but has no grand entrance, an omission, we are told, occasioned by the prudence of the magistrates, who had the superintendance of the building, for the purpose of preventing free access to the populace in case of tumult. The principal architect was John Van Kempen, who acted under the control of four burgomasters. The first of the numerous piles on which it is erected was driven on the 20th of January, 1648, and the last on the 6th of October following, when the first stone was laid. It was finally completed in 1655. The burgomasters' cabinet and retiring rooms, the treasury chamber, painter's chamber and the council of war chamber, are splendid apartments. The burgher's hall is a magnificent room, with sides of marble, 120 feet long, 57 broad, and 80 high, having galleries 21 feet in width. It is entered under a Corinthian colonnade of red and white marble, by massy bronze gates and railing finely executed. On the floor the terrestrial and celestial globes are delineated, in circles of 22 feet in diameter, by inlaid work of brass and variegated marbles. There are three of these circles; two of which are devoted

to the hemispheres of the earth. At one end is a colossal Atlas, supported by Vigilance and Wisdom, and bearing the globe on his shoulders. From this hall a double staircase leads to the tribunal, another principal apartment of the stadthouse, which occupies a large portion of the ground floor. Its walls are also of white marble, adorned with figures in bass relief, symbolical of the purposes to which it is devoted. The centre of the grand saloon was drawn by Huygens; but, unfortunately, its basement has been injured. On the front of the exterior is a marble pediment, on which is a female figure supporting the city arms; her chair supported by two lions. On each side are Naiads, presenting her with crowns, and different sorts of fruit. There is also a Neptune, accompanied by tritons, a sea-unicorn, and a sea-horse. Over these are three bronze statues, representing Justice, Strength, and Plenty; and on the top of the whole a round tower, adorned with statues, and containing a chime of bells. This magnificent edifice formerly contained prisons both for criminals and debtors; but they have been lately transferred to more suitable abodes; and the stadthouse has become a royal palace.

Other edifices which deserve attention are the East and West India houses, the bank, the admiralty, the three weigh-houses, the corn-exchange, the tower, known by the name of Herrings-pakkerstooren, and various magnificent private dwellings. The Old Church, in which is a chapel, with windows of painted glass, and the New Church, containing the tombs of the celebrated De Ruyter, admiral Bentink, and the poet Vondel, are the parish churches of the city. The exchange is a plain but commodious fabric of freestone, covered with tiles, in length 230 feet, and in breadth 130. It will contain about 4500 persons; and like that of London is principally resorted to after midday. For the accommodation of foreigners, each of the forty-six compartments below the gallery is destined for the transaction of different sorts of business: thus Nos. two and three are occupied by the German Jews; Nos. four and five by the tobacco merchants; Nos. eight, nine, &c. by traders from the south of Europe; the middle part by British and French merchants, &c. The government of Amsterdam is vested in a council or senate, consisting of thirty-six members, and twelve burgomasters. The members sit during life, and fill up by their own suffrages the vacancies that occur in their numbers. The burgomasters, who are chosen by the citizens out of a double number first nominated by the council, sustain the active magistracy of the city in rotation, the government of each lasting three months; and the four who are to preside during the year being annually appointed burgomasters' regent, an office very similar to that of the Lord Mayor of London. There is also a court of burgomasters, which decides all criminal cases; but in civil causes there is an appeal to the provincial council. The senate of Amsterdam formerly appointed the deputies to the states-general, in which this city only held the fifth rank, although it sent four representatives, or double the number of any other of the cities of Holland.

With the general commerce of Holland that of Amsterdam declined for many years previous to the late settlement of Europe. This has been ascribed to different causes, such as the superiority of the British navy, and the control of British conquests in our wars with Holland; the exactions of the French during the revolutionary law, &c. Certain it is that this celebrated port exhibits nothing like the 'forest of masts' that formerly appeared here. Yet is its general commerce very considerable, and perhaps reviving, especially in the various productions of neighbouring countries—gold, silver, jewellery, and spices. Adjacent are manufactures of velvets, carpets, stuffs, damasks, galoon, lace, and woollen cloths; tanneries; sugar-refineries, &c. There is also a Lombard, or deposit-house in the city, on a very respectable foundation. The water in the neighbourhood is said to be so unfit for culinary purposes, that water-merchants, who bring gallon-bottles of that necessary of life from Utrecht, drive a good trade; and those who cannot afford to buy of them are obliged to use rain water.

Amsterdam in modern times has been transferred to various masters: it was the capital of the Batavian republic, under the authority of France, in 1795; the seat of royal government under Louis Buonaparte in 1806; and incorporated into the French empire with the rest of Holland on the abdication of Louis, in July, 1810. In 1813 it led the way in recalling the house of Orange to its ancient sway; a provisional government was formed here 18th November; and in December William Frederic, Prince of Nassau and Orange, was first declared sovereign Prince, and by act of congress in May, 1815, king of the Netherlands.

Amsterdam, a town of what may now be called British, formerly Dutch Guiana, once the seat of government of the colony of Berbice. Dr. Bancroft, in his history of Guiana, places it 100 miles from the sea-coast, a circumstance which, together with the difficult navigation of the river Berbice, on which it stands, induced the Dutch to resolve on transferring the seat of government to a more convenient spot, so far back as the year 1766; and a suitable site was accordingly fixed upon on the northern shore of the river, about a mile from its mouth. On the conquest of the colony, however, by the British, in 1796, the town was just emerging from the marshes of the neighbourhood.

Amsterdam, New, is the name that was given to the new capital of Berbice. It stands at the confluence of the Berbice and Canje rivers, in N. lat. 6° 20′, W. long. 57° 15′; and is laid out with every kind of attention to convenience, which the long experience of its projectors could be supposed to suggest. Each house faces one or other of the rivers, and is surrounded by a quarter of an acre of land, bounded by a trench or dike, which regularly receives the tide, and while it carries off the offals of the establishments, promotes the circulation of air throughout the town. Within this enclosure a kitchen

generally appears. The houses of the Dutch inhabitants are thatched with the leaves of the troolie or plantain tree; the former being a prodigy of nature peculiar to this part of the world. They are leaves which generally grow from one stem close to the ground, (the stem terminating in the rib, as it were, of the leaf,) and extend to twenty-five or thirty feet each in length, and from two to three feet in breadth. But the English inhabitants uniformly prefer a shingle roof, from the great annoyance that they find in the insects and vermin of the thatch. The houses are long and narrow, protected on each side with galleries to shade them from the sun, and seldom more than two stories high. The government houses and public offices, are built of brick, in a superior European style; and surmount with an imposing effect the agreeable line of islands that stretches along the Berbice to the extent of a mile and a half.

Amsterdam Island, a small island on the north-west coast of Ceylon, five miles long, and two in breadth. Long. 8° 1′ E., lat. 9° 50′ N.

Amsterdam Island, an island of the South Pacific Ocean, first visited by Von Vlaming, a Dutch navigator, in 1697, and explored in 1793 by the gentlemen attached to Lord Macartney's embassy to China. It lies in E. long. 76° 54′, and S. lat. 38° 42′. Of the shape of a horse-shoe, nearly closed at the points; it contains a harbour or basin in the centre, the entrance to which might easily be made navigable to vessels of any burden. The length of the island from north to south is upwards of four miles; its breadth from east to west, about two miles and a half; and its circuit about eleven miles. The harbour, with its surrounding rocks, is of the shape of an elliptical funnel, or inverted cone, whose longest diameter at the water's edge is 1100 yards, and the shortest about 850; its circumference being 3000 yards, or about a mile and a half. At the top it is about two miles round. A fertile but very soft and spongy soil covers the island, which bears everywhere such unquestionable marks of volcanic origin, that the scientific gentlemen above alluded to, had no doubt of the harbour itself having once formed an immense crater. The island is inaccessible on every side but the east, or through the narrow strait by which the basin communicates with the sea; it stands 200 feet out of the water, as seen from the outward shores; and the land slopes upward all round to its internal edge, or the mouth of the crater, which is formed of layers of lava rising about 730 feet from the water below. On the western side, which is nearly perpendicular, the depositions of successive eruptions may be distinctly traced; a glassy layer being lowest, the compost next, the cellular next above it, and over it volcanic ashes and lighter substances, covered by a layer of vegetable mould. In the same quarter, and toward the south-west, are four small volcanoes, with regularly formed craters, containing lava of recent formation, and constantly emitting elastic vapours. The ground in this part of the island is tremulous under the feet, which cannot be kept in one place for a quarter of a minute together, and stones thrown sharply on the surface return a hollow sound. The island generally is penetrated by fissures, from which smoke issues in the day, and flames at night; the latter giving an awful appearance to the surrounding scenery, as seen from our ships in the offing. Several springs of hot water were visited by our countrymen on the occasion above-mentioned, of which the average heat was above 212° Fahrenheit's thermometer; and a large party regaled themselves with tench, bream, and perch, taken with a hook and line from the basin, and boiled in about fifteen minutes in the water of the adjacent springs, as it flowed from the ground. One gentleman in the suit of Lord Macartney accidentally plunged his foot through the layer of mould on the western side, and it was severely scalded. The holes that have been made by various visiters have been built in by the sea-birds that abound in the neighbourhood; which, in no small degree, increases the annoyance of the walk across the island. Near the centre is an area of about 200 yards square, where the heat of the soil is so great as to admit of no vegetation. Here one of the hot springs is supposed to take its rise, and to break through the interstices of lava to its mouth, which is just above the water in the great basin below. All the springs of hot water, except one, are brackish; this is a pretty strong chalybeate, and flows to some distance in a small collected stream, through a crust of ochre which it has deposited. Its temperature is not above 112°, and the water is very safe for use. Large beds of moss of the marctantia and lycopodium species, variegate the surface of the island in some places; and on part of it being torn away, it disclosed, in 1793, a thin hot mud, in which a thermometer rose immediately to the boiling point. This substance overspreads the barren spot in the centre of the island; and on removing it copious streams of vapour arise, while the sound of bubbling water may be heard in applying the ear to the ground. Veins of vitrified matter, in a liquid state, were seen running down in many places into the basin. This reservoir, which, if once the crater of a volcano, was one of the largest in the world, receives the tide regularly through its mouth, at the rate of about three miles an hour. Within the basin, it rises perpendicularly eight or nine feet at the full and change of the moon; and during the winter months, all kinds of storms and agitations pervade this place. Sometimes the whole mass of waters seem to heave upward from the bottom, and whirlwinds scatter them in immense sheets above the surface of the surrounding rocks. The entrance appears to have been formed by a recent eruption of the sea; for, in 1697, Von Vlaming noticed a low bar across it, upwards of five feet above the surface of the ocean; it is still shallow, and accessible only to boats. The shores of this island abound with seals of the phoca ursina species. The ships of the embassy, in fact, were induced to stop here by the appearance of two men making signs from the precipice, who proved to be part of an American crew left to procure seal skins for the Canton market. The whole party consisted of

five, two American sailors, (originally from England), and two Frenchmen, commanded by a native of France. They had been here about five months, and had gathered 8000 skins; calculating upon 17,000 more before the return of their vessel from Nootka Sound. These are worth, at Canton, from one to three dollars each. The animal is killed as it is found basking in the sun, and the carcase is left to putrefy before the skin is taken off. Our people, who were here early in the year, found these disgusting objects scattered all round the island, and the stench from them intolerable. The summer is the season for their appearance, when they come ashore in droves of from 800 to 1000; sometimes plunging instantly back at the sight of man, at other times erecting themselves into a menacing posture, and remaining barking on the rocks until struck down. This is accomplished by a slight blow on the nose with a stick; and if 100 could thus be taken during the day, the adventurers abovementioned were content, as it was the full employ of five men to pin them down afterwards in a proper manner. Some of the oil they yield was gathered, and served as butter. It is remarkable, that the proportion of female to male seals, which came ashore here, is more than thirty to one. In winter these animals keep in deep water, and amongst the weeds, which seem to shelter them from its inclemencies; while the sea-lions (phoca leonina of Linnæus) appear in great numbers, and take their place upon the rocks. They are as large as from eleven to eighteen feet long, and make such a prodigious howling round the shore, that the British ships could distinctly hear them at their anchorage, a mile distant. Whales, sharks, cod, and craw-fish also abound in the neighbourhood.

AMSTERDAM, or TONGATABOO, an island in the South Sea, said to have been discovered by Tasman, a Dutch navigator. It is better known in modern geography by the latter name, which see.

AMTSHITKA, one of the Aleutian islands, about sixty miles in length. The eastern side is more rocky than the western; on the north there is a cluster of islands, and to the east and west rocky detached islets. It is altogether a barren spot.

AMTSZELL, a market town, castle, and parish, in the district of the lake of Constance, and kingdom of Wirtemberg, containing 2130 inhabitants. The town lies between Wargen and Ravensburg, eight miles east of the latter.

AMU GIHON, AMI, or OXUS, a river of Independent Tartary, formed by streams which issue from the mountains of Belur, on the confines of India and Persia, and flowing west by north through Bucharia. It enters the south extremity of the lake Aral after a course of 1200 miles.

AMUCHTA, one of the Aleutian islands, about twenty-seven miles long, containing a volcano.

AMUCK, or AMOK, an Indian term for slaughter, and an exclamation of certain Batavian slaves, who, when irritated, intoxicate themselves with opium, and run frantic about the streets. It is called running a-muck or amok: and Steele is supposed to have borrowed his tale of the mohock-club in the Spectator from this practice.

AMUCTICA, in medicine; from *ἀμύσσω*, to vellicate, medicines which vellicate the bronchia, and promote coughing.

AMUL, a town and district of Persia, in the province of Mazanderan. The former stands in a fertile plain at the foot of a hill, on the river Arasbei, and was formerly one of the best-fortified towns in Persia. There are still some remains of a castle, which the inhabitants say is 4000 years old. The building of the town itself is ascribed to Shah Suhak, a celebrated Persian chief, in the eleventh century. The Arasbei is crossed by a fine bridge of stone, erected in the year 1680, by a Mahommedan priest. After it was finished at his sole expense, he is said to have pronounced an anathema against all those of elevated rank who should cross it on horseback which to this day is religiously avoided. In the suburbs there is a palace two stories in height, said to have been built by Shah Abbas. There are also three sepulchral towers, supposed to have been fire temples of the ancient Guebres. A population of about 800 subsist by the cultivation of rice and cotton; or by working at the several iron founderies and forges of the neighbourhood. Distant from Casbin about 120 miles E. N. E.

AMULA, in antiquity, a small vessel, with lustral waters in it, usually carried in the pocket by the ancient Romans, for purification and expiation, whence some derive the word AMULET.

AM'ULET. *Amuletum* (Vossius), from *amolior, amolitus*, (from *a*, and *moles*, a heap of moss), to move away, to expel. Hence, a driving away; a preservative against [diseases], a charm.

Amulets, made up of relics, with certain letters and crosses; to make him that wears them invulnerable.
Bp. Hall's Cases of Conscience.

That spirits are corporeal, seems at first view a conceit derogative unto himself; yet herein he establisheth the doctrine of lustrations, *amulets*, and charms.
Brown's Vulgar Errours.

They do not certainly know the falsity of what they report; and their ignorance must serve you as an *amulet* against the guilt both of deceit and malice.
Government of the Tongue.

AMULETICS, or SYMPATHETICS, in medicine, are chiefly used to stop bleedings; such as the persicaria, lapis hæmatites, dried toads, &c.

AMULETS, in the days of superstition, were much esteemed as charms or preservatives against mischief, witchcraft, and diseases. They were made of stone, metals, vegetables, animals, and, in a word, every thing that imagination suggested. Sometimes they consisted of words, characters, and sentences, ranged in a particular order, and engraved upon wood, &c. and worn about the neck, or some other part of the body. See ABRACADABRA, and ABRASAX. The Greeks called this species of amulets *φυλακτήρια*, phylacteries. Sometimes they were neither written nor engraved; but prepared with many superstitious ceremonies, great regard being usually paid to the influence of the stars. The Arabians have given to this species of amulet the name of talisman. All nations have been fond of amulets. The Egyptians had a great variety; and the Jews had an early propensity to using them. Compare Deut. xviii. 10—12, with Jer.

viii. 17. In later times the Mishna allowed an amulet to be worn which had previously been three times successful. The Chaldeans, Persians, and oriental nations, also held them in the highest estimation. Amongst the Greeks, amulets were much used in exciting and conquering the passion of love; and Pliny mentions many that were in use among the Romans. Ovid speaks of Mount Caucasus as yielding the necessary plants,

——— An quæ
Lecta Prometheis dividit herba jugis;

and Colchis is mentioned by other poets as noted for similar productions. They were also sometimes appended to the bodies of beasts, for medical and other purposes. Among the Christians of early ages amulets were made of the wood of the cross, or ribbands with a text of scripture written in them, as preservatives against diseases. The pope is still supposed to have the faculty of making successful amulets, which he exercises in the consecrating of Agnus Dei, &c. The sponge which has wiped his table was formerly in great veneration as a preservative from wounds, and even death itself: on this account it is said to have been sent with great solemnity by Gregory II. to the duke of Aquitain. Amulets are now justly exploded; but the great Mr. Boyle alleges them as an instance of the influx of external effluvia into the habit, in order to show the great porosity of the human body! He adds, that he is persuaded some of these external medicines do answer; for that he himself, having once been subjected to bleed at the nose and having applied several remedies to check it, found the moss of a dead man's skull (though only applied so as to touch the skin till the moss was warm thereby), the most effectual of any! 'Burton On Melancholy' prescribes some, while he deprecates the use of others, as cures for it. 'I say with Renodeus, they are not altogether to be rejected; Piony (he adds) doth cure epilepsie; pretious stones most diseases; a wolf's dung, born with one, helps the colick; a spider an ague,' &c.

It will assist the readers of our early poets, to peruse a curious extract from the scarce work of Regnald Scot, on the Discoverie of Witchcraft, with respect to what was once thought to be the specific virtues of certain stones worn as amulets: 'An agat (they saie) hath vertue against the biting of scorpions or serpents. It is written (but I will not stand to it) that it maketh a man eloquent, and procureth the favour of princes; yea, that the fume thereof dooth turn awaie tempests! Chelidonius is a stone taken out of a swallowe, which cureth melancholie! Amethysus maketh a droonken man sober, and refresheth the wit! The corall preserveth such as beare it from fascination or bewitching, and in this respect they are hanged about children's necks! A topase healeth the lunatike person of his passion of lunacie! Aitites, if it be shaken, soundeth as if there were a little stone in the bellie thereof: it is good for the falling sicknesse, and to prevent untimelie birth! Chalcedonius maketh the bearer luckie in law, quickeneth the power of the bodie, and is also of force against the illusions of the divell, and phantasticall cogitations! Corneolus mitigath the heate of the mind, and qualifieth malice, it stauncheth bloudie fluxes! Iris helpeth a woman to speedie deliverance, and maketh rainebows to appeere.' He more wisely adds: 'Hereby ye may understand, that as God hath bestowed upon these stones, and such other like bodies, most excellent and woonderful vertues; so according to the abundance of humane superstitions and follies, manie ascribe unto them either more vertues, or others than they have.' See *Drayton's Muse's Elysium, 9th Nymphal*, which is in fact a parody of the above.

AMUND, or Aamund, in old law; from *a* privative, and the Saxon *munde*, tuition; a person discharged from tuition or wardship.

AMUR, or Jamur, a considerable river in Asiatic Russia, which is formed by the junction of the rivers Argun and Schilk, and falls into the sea of Okhotsk, about 53° N. lat. It was formerly named Charan-Muran, but at present the Chinese call it Sagalin-Ula and Gelong-Kiang, or the Dragon river. It has a course of 400 miles.

AMURACORY, a corps of Turkish soldiers belonging to the order of the Janissaries.

AMURATH, or Amurat I., the fourth emperor of the Turks, and one of their greatest princes, succeeded Solyman in 1360. He took from the Greeks Gallipoli, Thrace, and Adrianople, which last he chose for the place of his residence. He is said to have gained thirty-six battles; and, in order to form a body of devoted life-guards, appointed his officers to seize annually the fifth part of the Christian youth taken in war These, after being instructed in the Mahommedan religion, inured to obedience by severe discipline, and trained to warlike exercises, formed the first corps of Janissaries, or New Soldiers, who soon became the chief strength of the Ottoman armies. At length the death of Lazarus, despot of Servia, who had endeavoured in vain to stop the progress of Amurath's arms, touched Milo, one of his servants, in so sensible a manner, that in revenge he stabbed the sultan in the midst of his troops, and killed him upon the spot, A. D. 1389, after he had reigned twenty-three years.

AMURCA, in pharmacy, an astringent medicine made of the refuse of expressed olives. Hippocrates applies the word to a putrid state of the liver.

AMUSE', Amuse'ment, Amu'sive, Amu'sively. Fr. *muser, amuser*, supposed to derive its origin from the Latin *musa*. Hence it may mean to cultivate an acquaintance with the Muses by way of relaxation from severer studies and employments; to entertain by directing the attention to lighter subjects; to promote pleasure; to lull by quiet and soothing occupations; to entertain; to divert; to recreate. In an old sense it was synonymous with 'to muse,' which see.

Suffryinge yourselues to be deceyued throughe the volupte and delectation of youre eares, as they do that *amuse* themselfe sonner to heare the sophistes and logyeyans to dispute, than to heare speake of the affaires of the cytie.

Translation of Thucidides, b. iii. p. 80.

Flowers of rhetoric in sermons and serious discourses are like the blue and red flowers in corn, pleasing to those who come only for *amusement*, but prejudicial to him who would reap profit from it. *Pope.*

I yesterday passed a whole afternoon in the church-yard, the cloisters, and the church, *amusing* myself with the tomb-stones and inscriptions that I met with in those several regions of the dead. *Addison.*

In latter ages pious frauds were made use of to *amuse* mankind. *Id.*

But amaz'd,
Behold th' *amusive* arch before him fly,
Then vanish quite away. *Thomson.*

As Atlas groan'd
The world beneath, we groan beneath an hour;
We cry for mercy to the next *amusement*:
The next *amusement* mortgages our fields. *Young.*

To me 'tis given, whom fortune loves to lead
Through humbler toils to life's sequester'd bowers:
To me 'tis given to wake th' *amusive* reed,
And soothe with song the solitary hours.
Whitehead's Elegies, 3.

We never consider ourselves as possessed at once of time sufficient for any great design, and therefore indulge ourselves in fortuitous *amusements*. *Rambler.*

Happy are they whose *amusement* is knowledge, and whose supreme delight is the cultivation of the mind. *Hawkesworth's Telemachus.*

But hail, ye mighty masters of the lay,
Nature's true sons, the friends of man and truth,
Whose song sublimely sweet, serenely gay,
Amused my childhood and informed my youth.
Beattie's Minstrel.

AMUSETTE, in military affairs, a species of offensive weapon, invented by the celebrated Marshal Saxe. It is fired off in the same manner as a musquet, but is mounted nearly like a cannon, and it was found of considerable use to the French and Prussians during the late war. They armed their horse artillery with it. The ball with which it is loaded is from one pound and a half to two pounds weight.

AMUTURI, a large river of South America, in the new kingdom of Granada, which, being united to the Cazanare, enters the Orinoco on the north side.

AMY, Fr. a friend; in law, a person next of kin to an orphan, and who is to be intrusted for him; called also AMY PROCHEIN.

AMY ALIEN, a foreigner residing in Britain, but subject to some power in alliance with us.

AMYCHE, in medicine; ἀμυχή, from ἀμύσσω, to scratch; a superficial exulceration or scarification, according to Hippocrates.

AMYCLÆ, in ancient geography, a city in Laconia, distant about eighteen miles from the metropolis, famed for the birth of Castor and Pollux. It sent a considerable colony of its inhabitants into Upper Calabria, who built there a city which they called by the same name. See next article.

AMYCLÆ, a city of Italy, in Calabria, situated between the Cajeta and Terracina. According to Pliny and Solinus, its territory was so infested with vipers and other serpents, that the inhabitants were obliged to abandon their original dwellings. Among the ancient poets they obtained the epithet of taciti, or silent, from a law which forbade any one under severe penalties to mention the approach of an enemy. In the end this proved the ruin of Amyclæ; for the Dorians appearing unexpectedly under the walls, no one ventured to transgress the law, and the city was easily taken.

AMYGDALA, in natural history, a species of echinus marinus, of the genus of the brissoides. See ECHINUS.

AMYGDALÆ, in anatomy, two glands of the fauces, called tonsils

AMYGDALÆ, in surgery, superfluous flesh growing at the root of the tongue.

AMYGDALATE, in pharmacy, an artificial milk or emulsion made of almonds.

AMYGDALOIDES LAPIS, in natural history, a stone which resembles the kernel of an almond. It is no natural fossil, but the petrified spine of an echinus marinus, or sea-urchin, of the nature of the lapis judaicus, but wanting the pedicle or stalk.

AMYGDALOID, in mineralogy, a compound mineral, composed of spheroidal particles or vesicles of lithomarge, green earth, calc spar, and steatite, imbedded in a basis of fine grained green stone, or wacke, containing also sometimes crystals of horneblend.

AMYGDALUS, in botany, the ALMOND and PEACH; a genus of the monogynia order, belonging to the icosandria class of plants; and, in the natural method, ranking under the 36th order, Pomaceæ. The characters are: CAL. a single-leaved perianthium beneath, tubular, and quinquefid: COR. five oblong petals, which are inserted into the calyx: STAM. thirty slender erect filaments, half the length of the corolla, and inserted into the calyx; the antheræ are simple: PIST. a round villous germen above; a simple stylus, the length of the stamina; and the stigma headed: PER. a large roundish villous drupa, with a longitudinal furrow: the seed an ovate compressed, not perforated in the pores. There are, 1. A. communis, or common almond, a native of Africa, near twenty feet high; and whether planted singly in an open place, or mixed with others in clumps, shrubbery quarters, &c. one of the finest flowering trees in nature; 2. A. nana, the dwarf almond, a native of Asia Minor; 3. A. persica, or the peach, said to be a native of Europe; but of what place is not known. Cultivation has produced many varieties of this fruit; of which the following are the most esteemed:

1. Admirable.
2. Beautiful Chevreuse.
3. Bellegarde.
4. Bloody Peach.
5. Bourdine.
6. Catherine.
7. Chancellor.
8. Early Purple.
9. Great French Mignon.
10. Late Admirable.
11. Late Purple.
12. Malta.
13. Monstrous Pavy.
14. Montauban.
15. Nivette.
16. Old Newington.
17. Persique.
18. Portugal.
19. Rambouillet.
20. Red Magdalen.
21. Red Nutmeg.
22. Rossanna.
23. Royal.
24. Small Mignon.
25. Smith'sNewington.
26. Venus's Nipple.
27. Vineuse.
28. White Magdalen.
29. White Nutmeg.
30. Yellow Alberge.

4. A. nuci-persica, or the nectarine, which, according to Linnæus, is only a variety of the peach, having a smooth coat, an accident originally. Of this many varieties are now cultivated; and the following are esteemed:

1. Elruge.	5. Newington.
2. Golden.	6. Roman.
3. Italian.	7. Scarlet.
4. Murrey.	8. Temple's.

AMYLACEOUS, in natural history; from amylum, starch; a term applied to the fine flour of farinaceous seeds, in which consists their nutritive part.

AMYLUM, } A privative, and μύλη, a
AMYLA'CEOUS. } mill. The substance called starch obtained from wheat without using a mill. The epithet is also applied to the mealy substance of potatoes, arrow-root, &c. used in medicine and domestic economy.

AMYMONE, in mythology, the daughter of Danaus and Europa, famous for an amour with Neptune, who raised a fountain in the place where he first beheld her. She is said to have married Enceladus, son of Ægyptus, and to have murdered him on the bridal night.

AMYN, a learned Persian author of the seventeenth century. His principal work is Heft Iclym, or the Seven Climates, being, it is said, a correct description of the countries, climates, &c. of the east.

AMYNTAS, in entomology, a species of Hesperia.

AMYNTICA EMPLASTRA, in pharmacy, defensative, or strengthening plasters.

AMYOT (James), bishop of Auxerre and great almoner of France, was born of an obscure family at Melun in 1514, and studied philosophy at Paris, in the college of Cardinal Le Moine. He was naturally dull, but diligence made amends for his defects; and he left Paris at the age of twenty-three, for Bourges with the Sieur Colin, who was at the head of the Abbey of St. Ambrose. At the recommendation of this abbot, Amyot was first received into the house of one of the king's ministers as tutor to his children; where he obtained the patronage of Margaret, duchess of Berry, sister to Francis I. through whose influence he was made professor of Greek and Latin in the University of Bourges. Here he translated into French the Amours of Theagines and Chariclea, from the Greek of Heliodorus. Having accompanied Morvillier to Venice, in his embassy from Henry II. to that republic, he visited Rome, and resided with the bishop of Mirepoix for two years. Soon after he was recommended by cardinal Tournon to the king, as preceptor for his two younger sons. While thus engaged, he translated the Lives of Plutarch. Charles IX. gave him the abbey of Cornelius de Compeigne, and made him grand almoner of France, and bishop of Auxerre. He was also appointed curator of the University of Paris; and Henry III. made him commander of the order of the Holy Ghost.—Some time before his death he was asked to compile a history of France, to which he replied, 'I love my sovereigns too well to write their lives.' He died in 1593. His works are, 1. A Translation of Heliodorus, folio. 2. Diodorus Siculus, folio. 3. Daphnis and Chloe, from Longus, 4to. 4. Plutarch's Lives and Morals, 2 vols. folio. 5. Lettre a M. de Morvillie, containing an account of the author's journey to Trent. 7. Œuvres Melées, 8vo. 8. Projet de l'Eloquence Royale, 8vo.

AMYRALDISM, a name given in the seventeenth century to the doctrine of universal grace as explained and asserted by Moses Amyrault and his followers, which was in substance, that God desires the happiness of all men, excluding none by a divine decree; that he refuses to none the power of believing, but that he does not grant to all his assistance, that they may improve this power to saving purposes.

AMYRAULT (Moses), a French protestant divine, born at Bourgueil in Touraine in 1596. He studied at Saumur, where he was chosen professor of theology. His works gained him the esteem of Catholics as well as Protestants, and the friendship of Cardinal Richelieu, who consulted him on a plan of re-uniting their churches, which was altogether unsuccessful. He published a treatise on the doctrine of predestination and grace; an Apology for Protestants; a Paraphrase on the New Testament; and several other works.

AMYRBERIS, in botany, a name used by some authors for the barbery tree.

AMYRIS, a genus of the monogynia order and decandria class of plants. The characters are: CAL. a small single-leaved perianthium, four-toothed and persistent: COR. four oblong petals, concave and expanding: STAM. eight erect subulated filaments: ANTH. oblong, erect, length of the corolla: PIST. ovate germen above: STY. thickish, length of the stamina: STIG. four-cornered: PERICARP. a round drupaceous berry: SEED globular glossy nut. The most remarkable species are:—1. A. balsamifera, or rose-wood, found in Jamaica and the West India Islands. 2. A. elemifera, or shrub which bears the gum elemi, a native of South America. 3. Gileadensis, or opobalsamum, found in Arabia Felix. 4. A. toxifera, or poison wood, found in Providence, Ilathera, and others of the Bahama Islands. From the amyris elemifera, which is called by the natives of the Brazils icicariba, is obtained the resin improperly called gum elemi, or gum lemon. This drug is brought to us from the Spanish West Indies, and sometimes from the East Indies. The amyris gileadensis yields the balsam of Mecca, of Syria, or of Gilead, the most fragrant and pleasant of any of the balsams. The true balsam-tree is found near Mecca.

AMZEL, in ornithology, the name of a bird of the merula, or black-bird kind, of which there are two species; the ring amzel, or merula torquata, and the merula montana, called simply the amzel. The ring amzel is a little larger than the common black-bird. The back dusky blackish brown, throat and breast variegated with white, the lower part of the throat surrounded with a broad white ring, whence the bird derives its name. The wings and tail are blackish, but in the female variegated with white. This bird feeds on insects and berries, and is common about the Peak of Derbyshire, where it is called the rock ouzel.

AN, Ang.-Sax. Eine, one; the original article *a*, or rather *an*.

Robert verst Courtehese hys gode suerd adrou,
And smotte *anne* vp pe helm, and sucha stroke him-ȝef,
þat þe scolle, and tep, and þe necke, and þe ssoldren he to clef. *R. Gloucester*. p. 401.

Thoroue lyvar and longs bathe
The sharp arrowe ys gane,
That never after in all his lyffe days,
He spayke mo wordes but *ane*;
That was Fyghte ye, my merry men, whyllys ye may,
For my lyffe days ben gan.
Percy's Reliques, vol. i. p. 11.

It is certain that odours do, in a small degree, nourish; especially the odour of wine; and we see men *an* hungred do love to smell hot bread. *Bacon*.

A wit's a feather, and a chief a rod,
An honest man 's the noblest work of God. *Pope*.

AN; the imperative An of the verb Anan, to grant: *Tooke*.

An aȳ bi it selue for fiue schillynges was bouht,
A pere for penyes tuelue, or þei had it nouht.
R. Brunne. p. 175.

And eftsoone he denyede with *an* ooth for I knowe not the man.
Wiclif. Matthew, c. xxvi. p. 22.

Lady Helen ran to the deip draw-well,
And knelt upon her kne.
My bonny sir Hew, *an* ze be here
I pray thee speak to me.
Percy's Reliques, v. i. p. 40.

Q. Pyr. Nay, *an* thou dalliest, then I am thy foe,
And fear shall force what friendship cannot win.
Ben Jonson's Poetaster.

ANA. A plural termination in the Latin language, and properly denoting a book, or collection of the short sayings, maxims, and criticisms of wise men, taken from their conversations and posthumous papers, &c. They are called books in ana, of which Wolfius has given a complete history in his preface to the Casaubomana, where he observes, that though the name be new, the composition is more ancient than is commonly imagined. It appears from D' Herbelot's Bibliotheque Orientale, that the eastern nations have always been in the habit of preserving the maxims of their sages. Xenophon and Plato collected the sayings of Socrates. Cæsar compiled the apophthegms of Cicero. Caius Melissus recorded the observations of Mæcenas. Arian collected the aphorisms of Epictetus, although the Enchiridion is now lost in the lapse of time. The numerous maxims and observations scattered in Plutarch, Diogenes Laertius, and others, evince an extreme solicitude in Greece to preserve the ideas and sentiments of illustrious men. Aulus Gellius has filled his Noctes Atticæ with anecdotes and observations of eminent characters whose society he frequented in Rome. De Jocis Cicero was a work of three volumes. De Vassan commonly wrote down whatever things of importance he heard Scaliger say. In some cases the minuteness of such a practice might be highly proper. Had the pertinent remarks that dropped from the orators, statesmen, and sages of Greece and Rome, been handed down to us, or at least a selection of them, they would have been attended with considerable practical utility—would have furnished the polite world with a fund of short truths and sentiments on every subject in the most perfect form—would have relieved the inanity of conversation; and, being perfectly classical, would have exercised an imperceptible influence on the formation of taste; in short, would have been a Colloquia Mensalia, through which we might see the ancients and enter into the spirit of their conversations. 'The conversations of the ancients,' says a late author, 'would have been of more use to us than all their volumes, and would have more effectually blended instruction and entertainment.' The proverbs of Solomon, copied by the scribes of Hezekiah, of which those in Scripture are a selection, afford, perhaps, the first instance of this species of writing. The Gemara of the Jews, the Memorabilia of Xenophon, the dialogues of Plato, the Enchiridion of Diogenes, the small collections of Laertius, Athenæus, and Plutarch, are all of this description; as also the Orphica, Pythagoræ, Æsopica, Pyrrhonea, &c. The term ana seems to have been applied to such compositions as far back as the fifteenth century. Poggio Bracciolini, being secretary to five successive popes, used to attend, with a number of eminent persons, in the common hall adjoining the Vatican, to converse freely on all subjects. This place they termed a place of recreation; Poggio called it Mendaciorum Officina. The jests and anecdotes related at this meeting were formed by Poggio into a collection, and called the Poggiana. Some of them are evidently taken from ancient authors, and not a few from the Fabliaux of the Troveurs. The Fabliau La Culotte des Cordeliers is the Braccæ Divi Francisci of Poggio. Le Meunier d'Aleus is Poggio's Quinque Ova. Du Vilain et de sa Femme is his Mulier Demersa, and Du Pré Tondu is the Pertinacia Muliebris of the Facetiæ. The Scaligerana, containing the observations of Scaliger, was the first work that was actually published to the world under the title of ana, and led the way to that class of publication. It consists of two collections, Scaligerana Prima and Scaligerana Secunda. The first was collected by Francis Vertunien Sieur de Lavau, who attended the family of the Messieurs Chateigner where Scaliger resided. The work lay in manuscript many years after the compiler's decease, and was at length purchased by M. de Sigogne, and published in 1669 under the title of Prima Scaligerana, nusquam antehac edita. Scaligerana Secunda was published three years before the work just mentioned, although compiled more recently; and was collected by two brothers of the name of Vassan, who went to complete their studies at the university of Leyden, of which Scaliger was at that time one of the professors. Being particularly recommended to Scaliger, they were received into his house, and enjoyed his daily conversations, which they wrote down, and soon made up a large manuscript volume. It was published by Isaac Vossius under the title of Scaligerana, sive excerpta ex ore Josephi Scaligeri. About the beginning of the eighteenth century this species of literature was much cultivated. The Menagiana is of its kind thought valuable. Menage was a person of good sense, a communicative disposition, and of extensive

information. He lived in the best and most polished society, and had a meeting of literary characters at his house on every Wednesday. During the latter part of his life he daily received persons of that description, and being lively in conversation, and at the same time judicious and happy in his opinions, his friends, who had been themselves improved by his remarks, recorded them for the benefit of others. A collection was published shortly after his death, 1693; and in 1715 augmented by M. La Monnoye, under the title of Menagiana. The Valesiana is a collection of the literary opinions of the historiographer Adrian Valois, published by his son, and contains many valuable historical observations. The Perroniana and Thuana are inconsiderable. The Fureteriana contains few topics or criticisms on subjects generally interesting, but alludes chiefly to the dispute which arose between himself and the French Academy, of which he was a member.

The Chevræana, so called from M. Chevreau, evinces considerable erudition; and contains, among other interesting articles, a learned and ingenious commentary on the works of Malherbe, to whom the French language and poetry were highly indebted. The Parrhasiana is the work of Jean Le Clerc, a professor of Amsterdam. It contains much learned philological disquisition, and a dissertation on poetry and eloquence. The Huetiana contains the detached thoughts and criticisms of Huet, bishop of Avranches, a person of extensive reading, who had enjoyed the society of many distinguished characters. Being attacked in the decline of life by a malady which impaired his memory, he employed himself in committing to paper detached observations; which were published after his death, by the Abbé d' Olivet, under the name of Huetiana. Many parts of this work are valuable; and if some of his opinions in matters of taste display singular or defective feelings, there are others which are just and refined. The Casauboniana contains the miscellaneous observations of the celebrated Isaac Casaubon, who, during his whole life, used to commit to paper any thing remarkable which he heard or read. This compilation was styled Ephemerides, and with two others, viz. his Adversaria, and a body of materials amassed for a refutation of the ecclesiastical annals of Baronius came to the possession of his son Meric Casaubon, who bequeathed the whole to the Bodleian library, Oxford; where being shown to Christopher Wolfius, were by him transcribed for the press, and published under the title of Casauboniana.

The most important native publication which can be assigned to this class, is the Walpoliana, transcribed from the literary conversations of Horace Walpole, a gentleman distinguished for anecdote, wit, and epistolary correspondence. He had learned from his father, Sir Robert Walpole, many anecdotes concerning the political characters that figured during his administration; besides which, his personal acquaintance with the fashionable world, and his frequent visits to Paris, supplied him with interesting materials, which were freely and elegantly given in his friendly conversation. He was a gouty subject; and probably indulged in the pleasures of conversation to pass away the hours which would otherwise have been tedious and melancholy. It is related of him, that when living at Strawberry hill, he generally rose from table about five o'clock, and taking his place on his drawing-room sofa, would beguile away the hours till two o'clock in the morning, in miscellaneous conversations, full of singular anecdotes, strokes of wit, and acute observations. These after his death were collected, and published in two volumes, under the title of Walpoliana. The Baconiana Atterburyana will enliven the weary scholar in his heavy hours; but Horace Walpole was one of the most enlightened spectators of his age. Political characters and subjects were brought under his daily review; and being endowed with a vivacity of temperament beyond most other men, he sketched the most lively pictures of the morals and manners of the reigns of George the II. and III.; and was better calculated than any other man, to lead the way in this species of composition.

The Colloquia Mensalia of Luther comprehends certain conversations between Luther and his friends; and was first published in 1566. The emperor of Germany at the instigation of the Pope issued an edict to suppress the publication, inasmuch as it contained much sarcasm on the popish miracles, relics, &c. It was long supposed that all the copies were destroyed; but in 1626 Van Sparr, a German, having occasion to build on the foundation of a house formerly belonging to his grandfather, found a printed copy of the Colloquia in a deep hole wrapped up in a linen cloth. This he transmitted to his friend Captain Bell in England, who undertook a translation of it.

The next work of this description is Selden's Table Talk, written during twenty years' acquaintance by his Amanuensis. It contains many curious facts and opinions respecting the political and ecclesiastical history of his time. The sentiments are perspicuous and agreeable; and Clarendon acknowledges the author to be 'a clear discourser, who possessed the faculty of making difficult things easy, and of presenting them clearly to the understanding.' Boswell's Life of Johnson, and Cowper's Table Talk, have their several excellencies. The Italians in their Motti e Burle, and occasionally in their novels, have recorded the opinions and witticisms of their artists. Manso, in his life of Torquato Tasso, has made one book full of the sayings of that poet. His conversation, however, was neither gay nor brilliant. Goldoni's drama of Torquato Tasso thus contrasts his writings and conversation:

Ammiro il suo talento gradisco é carmé suoi
Ma piacer non trovo a conversar con lui.

The Italians have not distingnished themselves in ana; they want that mobility of imagination and strict vivacity of expression which forms the charm of social life. The Spaniards have distinguished themselves less than the Italians. The most perfect form of these works is that of the French. Upon the whole this kind of writing is calculated to pourtray the most lively

images of distinguished persons; and as men generally drop the mask in society, and converse in a manner quite unpremeditated, we shall find for the most part in books of ana the turn of mind and manner of thinking peculiar to those whose conversation they detail; they furnish, however, no data of their opinions. To support conversation, display ingenuity, surprize by paradoxes, and dazzle by shining metaphors, often beguile men in the hour of colloquial enjoyment, and prompt them to lay down positions which they never held in sincerity, and perhaps had never seriously examined. Dr. Southey has recently given a new application of the word ana in two volumes of miscellaneous observations, gleaned from some of the best fields of literature, under the appropriate title of Omniana.

ANA, an East Indian coin worth one shilling and eleven-sixteenths of a penny sterling.

Ana, in medicine, *ἀνὰ*, a term used in prescriptions for each, which is commonly written A or A A.

Ana Capri, a small town of the Neapolitan Island of Capri, belonging to the principata di Salerno. See Capri.

ANAB, a city in the hill country of Judah, south of Jerusalem, where Joshua extirpated the Anakim, supposed to be the same with Nob.

ANABAPTISM. See Anabaptists.

ANABAPTISTS; from *ἀνὰ*, over again, and *βαπτιστὴς*, a baptizer; in ecclesiastical history, a name that has been sometimes given to all those Christians who consider baptism by any other mode than that of immersion, or administered to any other subject than one who can give a confession of faith, invalid. For a detailed account of this denomination of Christians, the reader must refer to the word Baptists, and Baptism. We shall here give a few general observations explanatory of the historical sense of the term. It is certain that some of the earliest seceders from the Catholic church denied the validity of its baptism; and received none into their communion without re-baptizing them. Such was the conduct of the Novatians, Donatists, and others. The Catholics, on the other hand, denied the baptism of heretics to be valid; and many instances occurred, especially in the eastern churches, of re-baptism. Some German Baptists, especially in modern times, are said to have administered baptism more than once to the same individual; who, after having been excommunicated, was again received on a profession of repentance. The term, however, is chiefly applied in history to that body of religionists who disturbed the peace of Germany early in the sixteenth century; and greatly retarded the progress of the Reformation. The Catholics attribute to the worldly ambition of Luther the whole of that memorable war of the peasants, in which the Anabaptists took the lead; although it is well known that Luther protested against any connection with such parties. The ringleaders of this sect were three, Nicholas Storck, Mark Stubner, and Martinus Cellarius. They pretended that they were positively sent of God to teach, that they could foretell future events, and that they were on a footing with the prophets and apostles. Storck was a baker, and had chosen twelve of his own trade as his particular associates, whom he called twelve apostles, and seventy-two disciples. Cellarius had associated himself with Munzer, at Zwicka, in freaks of the wildest enthusiasm. Both these men were ignorant mechanics; Stubner had some learning, which he employed in perverting the Scriptures to subserve his purposes. Luther on his return from banishment, after an interview with these enthusiasts, dismissed them with these remarkable words: 'The God whom I serve and adore will confound your vanities.' It is evident from Melancthon's Epistle that they rejected the baptism of infants. Munzer after appeared at Alsted, on the borders of Thuringia, in the electorate of Saxony, where he inveighed against both the pope and the Reformation, asserted a divine commission to institute a new political community, took an oath of his followers to put to death all wicked persons, to appoint righteous magistrates, and to institute a new and holy society. The design however being discovered, he fled to Nuremberg; and on his expulsion thence retired to Mulhausen, where he had almost succeeded; for in 1525 vast numbers of peasants from Suabia, Thuringia, and Franconia, entered into his schemes, and the princes were at last compelled to unite their forces and have recourse to military measures before this desperate insurrection was quelled. Munzer, however, being slain in the battle, the few remaining peasantry dispersed, after a series of skirmishes and commotions, which cost the provinces 50,000 men.

Their opinions, according to Fueslin, were digested into the following points of doctrine: That the church of Christ ought to be exempt from all sin; that all things among the faithful should be in common; that all usury, tithes, and tribute ought to be abolished; that infant baptism was an invention of the devil; that every Christian was invested with a power of preaching, and that the church stood in no need of ministers and pastors; that in the kingdom of Christ civil magistrates were useless; that God still continued to reveal his will by dreams and visions to chosen persons; and that Christ was now about to assume the reins of civil government. Several laws against them were established in Saxony, Switzerland, and other parts of Germany, from the year 1525 to 1534. About the latter period they attracted considerable attention in Westphalia, under John Matthias of Haerlem and John Boccold of Leyden, two very able and intrepid leaders, one being a baker, and the other a journeyman tailor: both however are said to have possessed natural oratory in a considerable degree, bold and confident address, and many pretensions to superior sanctity. Having gained over a Protestant preacher of the name of Rothman, who had introduced the Reformation doctrines into Munster, and one Cnipperdoling, a citizen of influence and respectability, they determined to make that city one of the first rank in the empire, and the centre of their future efforts. Accordingly one night in February, having first seized the arsenal and senate-house, they ran

through the city, brandishing their drawn swords and crying, 'Repent and be baptized,' and also, 'Depart ye ungodly;' on which the consuls, the senate, the nobility, ecclesiastics, &c. fled with all possible precipitation. Matthias now assumed the supreme authority; ordered all the convertible property of the city to be collected into one common fund, and appointed deacons to distribute to the common necessity. All the people who declared themselves of the brotherhood had all things in common. Every one capable of bearing arms was trained for military duty, and every hand that could work employed either for the fortification of the city or the replenishing the magazines. Invitations were issued in all directions, calling upon all their brethren dispersed abroad to assemble for the purpose of prosecuting and sharing their triumphs. The city of Munster was now dignified with the name of Mount Zion; and assurances were held out that from this favoured spot their leaders would go forth and conquer all nations of the earth. Count Waldeck, the bishop and sovereign of Munster, nevertheless, in about three months surrounded the city with a considerable army; but Matthias sallying out with a chosen band put a large party of the besiegers to the sword, and returned in triumph into the city. Uplifted with his past success, he declared his intention to venture his life on his spiritual pretensions; and believing himself like Gideon, the chosen servant of heaven, he went forth with only thirty men to overthrow the host of his enemies. He soon, however, learnt his error, for they were all cut to pieces. Notwithstanding the sensation which this failure produced in the city Boccold, his coadjutor, quickly allayed the agitation of the public mind. Visions and predictions were continually announcing the approach of some great event, when Boccold stript himself naked and ran through the city, proclaiming 'that the kingdom of Sion was at hand; that the highest things on earth must be brought low, and the lowest exalted.' This was followed by the levelling of churches, the degrading of his most respectable associate, Cnipperdoling, even to the office of a common hangman. In the month of June it was declared by a fellow prophet to have been revealed to him from heaven, that John Boccold was called to the throne of David, and must be immediately proclaimed king of Sion; Boccold on his knees declared the same important circumstance to have been communicated to himself. He therefore accepted the divine intimation, was clothed in purple, dignified with a superb crown, and before him was publicly carried a Bible in one hand and a drawn sword in the other. He coined money bearing his own likeness, appointed body-guards and officers of state, and from his own household set apart twelve judges, in imitation of the judges of Israel. Doubts were hinted shortly after with respect to the obligation of matrimony, and the ineligibility of taking no more wives than one, which were followed by a solemn declaration that such restraint was an innovation on the rights of spiritual liberty; and the new monarch confirmed the doctrine by marrying three wives at once, one of which, the widow of his predecessor, was dignified with the name of queen. Freedom of divorce, and licentiousness the most degrading, succeeded. The siege of the city, however, became at last a close blockade; the supplies of the city were interrupted, and famine prevailed. New visions and revelations sustained the faith of the multitude; unbelief was punished with death; and Boccold, in the presence of all his family, cut off the head of one of his wives for having expressed some doubts of the divine authority of his mission. At length deserters from the besiegers, who had been taken into the service of the besieged, escaped from the city, and returning to the bishop, informed him of a weak place in the fortification. On June the 24th, being entrusted with a detachment, he ascended the wall and seizing one of the gates the city was broke up, and reverted to its rightful sovereign. Thus ended the kingdom of the Anabaptists at Munster, after a precarious dominion of fifteen months. Boccold and Cnipperdoling were taken prisoners; and the former, having been the chief instigator of their plans, was loaded with fetters, paraded in mock majesty through all the neighbouring towns, and exposed at last to the most excruciating tortures. It is but just to say, the reformers of Wirtemberg testified against this revolt during the whole period of its continuance; and stimulated the prince of Germany to suppress so vile a system of rebellion.

ANABASII, in antiquity, courters mentioned by St. Jerome, who were sent on horseback or in chariots, with despatches of importance.

ANABASIS, in botany, a genus of the class pentandria, order digynia. Its essential characters are:—CAL. a three-leaved perianthium, leaflets obtuse and spreading: COR. five-petalled: STAM. filaments filiform, longer than the corolla: ANTH. roundish: PIST. a germ roundish, acuminate, styles two: STIG. obtuse: PERICARP. a berry roundish, seed single and screw-shaped. There are four species:—1. A. aphylla, leafless A. a perennial plant found wild on the shores of the Caspian. 2. A. foliosa, leafy A. found wild on the shores of the Caspian. 3. A. tamariscifolia, tamarisk-leaved A. a native of Spain. 4. A. spinosissima, thorny A. its native place of growth is unknown.

ANABASIS, in medicine, an increase of fever.

ANABASIUS, a name given by Pliny to the Usnea, or long hairy tree moss.

ANABATA, in ancient customs, a sacerdotal vest, covering the back and shoulders of the priest.

ANABATHRA; from *ἀναβαίνω*, I ascend; in antiquity, a kind of steps or ladder to ascend some eminence. In this sense we read of the anabathra of theatres, pulpits, &c. Anabathra appears to have been sometimes also applied to ranges of seats rising gradually over each other, and a kind of stone blocks raised by the highway side to assist horsemen in mounting or alighting.

ANABATICA, in medicine, *ἀναβατικὰ*, a continued fever increasing in malignity.

ANABIBAZON, in astronomy, the dragon's head, or northern node of the moon.

ANABLEPS, in ichthyology, the trivial name of a species of cobitis. See COBITIS.

ANABOLÆUM, ANABOLE, in antiquity, a kind of upper coat usually worn over the tunica.

ANABOLEUS, in antiquity, an appellation given to those who assisted their masters in mounting their horses. The ancients had no stirrups.

ANABROCHISMUS; from *ἀνὰ*, upwards, and *βρόχος*, a loop; in ancient surgery, the operation of fastening up hairs in the eyelids when offensive to the eyes, the manner of performing which is described by Gorræus.

ANABROSIS, or DIABROSIS, in medicine, the issuing of blood at a hole worn in a vein by the corrosion of acrid humours.

ANACA, in ornithology, a Brazilian species of paroquet, of the size of a lark. The beak is brown and crooked, the head covered with feathers of a liver colour, and there are brown circles about the eyes; throat gray; the upper part of the neck and sides are green; the belly is of a reddish brown; back green, with a pale brown spot; and the tail also is of a pale brown. There is a deep blood-red mark at the top of each wing; the rest of the wings being green, except the extremities, which are bluish. The thighs are covered with green feathers, and the legs and feet are gray.

ANACALYPTERIA, from *ἀνακαλύπτειν*, to uncover; according to Suidas, festivals celebrated three days after marriage, when the bride first uncovered her face in the presence of men. Before marriage the Greek women were rarely permitted to appear in public, or converse with the other sex; and when allowed that liberty, they wore a veil over their faces, termed *καλύπτρον*, or *καλύπτρα*. The presents at that time given were also called *ἀνακαλυπτήρια*.

ANACAMPLOS, in Greek music, a succession of notes from acute to grave, and thus opposed to the euthia, which proceeds from grave to acute.

ANACAMPSEROS, in botany, a synonyme of the portulaca and several other plants.

ANACAMPTERIA, in ecclesiastical antiquity, edifices adjacent to churches, designed for the entertainment of strangers and the poor.

ANACAMPTIC, an ancient name for that part of the science of optics which treats of reflection. See CATOPTRICS.

ANACANDAIA, in zoology, a species of serpent found in the Island of Ceylon; also called bu'alinus, i. e. the destroyer of cattle.

ANACARDII, in entomology, a species of papilio, tribe parnassius. The wings are glassy and greenish; posterior pair brown at the tips, with two spots. Inhabits South America.

ANACARDIUM, or CASHEW-NUT TREE, in botany, a genus of the monogynia order, belonging to the decandria class of plants; and in the natural method ranking under the twelfth order, Holoraceæ. The characters are: CAL. divided into five parts, the divisions ovate and deciduous: COR. five reflected petals, twice the length of the calyx: STAM. ten capillary filaments shorter than the calyx, one castrated: ANTH. small and roundish: PIST. a roundish germen: STYL. subulated, inflected, and the length of the corolla: STIG. oblique: PER. none: RECEP. very large and fleshy; seed, a large kidney-shaped nut placed above the receptaculum. Only one species is known, viz., A. occidentale. It grows naturally in the West Indies, and arrives at the height of twenty feet in those places of which it is a native, but cannot be preserved in Britain without the greatest difficulty. The fruit is as large as an orange, and full of an acid juice which is frequently made use of in making punch. To the apex grows a nut of the size and shape of a hare's kidney; but it is much larger at the end which is next to the fruit than at the other. The shell is very hard, and the kernel which is sweet and pleasant, is covered with a thin film. Between this and the shell is lodged a thick, blackish, inflammable liquor, of such a caustic nature in the fresh nuts, that if the lips chance to touch it, blisters will immediately follow, which the West Indians use as a cosmetic. The kernels are eaten raw, roasted, or pickled. The milky juice of this tree will stain linen of a good black, which cannot be washed out. The plant is easily raised from the nuts.

ANACATHARSIS; from *ἀνὰ*, upwards, and *καθαιρω*, I purge; in medicine, a purgation by spitting; in which sense it stands contradistinguished from catharsis, or evacuation downwards. Some include amongst anacathartic medicines, all those which work upwards, by the glands of the head, whether vomitories, sternutatories, or masticatories.

ANACATHARSIS is also a name given by writers on civil law, to the basilicon repetitæ prælectionis, made by the emperor Constantine Porphyrogenitus. It was thus called as being a review, or correction of the basilicon.

ANACATHARSIS is likewise applied by divines to the clearing up of obscure passages of Scripture, by a spiritual or anagogical interpretation.

ANACEIA, an Athenian festival, in honour of Castor and Pollux. It took its name from those deities who were also called *Ἄνακες*, and honoured with a temple called Anacæum. The sacrifices offered at that time, were named *Ξενισμοί*, because those deities were *ξένοι*, or strangers; and consisted of three offerings which were called *Τριτια*, tritia. Athenæus mentions plays acted in honour of these deities.

ANACEPHALÆOSIS, in rhetoric; from *ἀνὰ*, again, and *κεφαλαίω*, to rehearse; recapitulation, or the summing up the heads of a discourse.

ANACHARSIS, a famous Scythian philosopher, who travelled to Athens in the time of Solon, and, wishing for his acquaintance, he sent him word that a Scythian was at the door, and requested his friendship. Solon replied, that friends were best made at home: 'Then let Solon who is at home, make me his friend,' was the smart retort of Anacharsis; and struck by its readiness, Solon admitted him. He was the only stranger ever admitted by the Athenians to the honour of citizenship. Crœsus invited him to Sardis, with the offer of riches, but he refused, saying, that he came to Greece for improvement, not for money. Upon his return from his travels, he attempted to change the ancient cus-

toms of Scythia, for those of Greece; which proved fatal to him; for the king his brother, despising his innovations, shot him dead in a wood with an arrow. Statues were erected to him after his death. He is said to have first suggested the use of the anchor. Anacharsis flourished about A. M. 3420.

ANACHIS, in mythology, one of four deities among the Egyptians, and to whom they imagined the peculiar care of each person was committed at his birth; the other three were Dymon, Tyches, and Heros. They were also called Dynamis, Tyche, Eros, and Ananche; i. e. power, fortune, charity, and necessity.

ANACHITES, in mineralogy, the name of the gem adamas, or diamond, so called on account of its being anciently supposed to expel fear from the mind.

ANACHORET; from *αναχωρεω*, I retire into a solitary place; in ecclesiastical history, a hermit, or solitary monk, who retires from the society of mankind into some desert, with a view to avoid the temptations of the world, and to be more at leisure for meditation and prayer. Such were Paul, Anthony, and Hilarian, the first founders of the monastic life in Egypt and Palestine. Anachorets among the Greeks consist principally of monks, who retire to caves or cells, with the leave of the abbot, and an allowance from the monastery; or who, weary of the fatigues of the monastery, purchase a spot of ground, to which they retreat, never appearing again in the monastery, unless on solemn occasions. When a number of these cells lay in the same wilderness contiguous to each other, they were called by the general name of launa, which differed from the cœnobium or convent inasmuch as it consisted of many separate cells, where each monk supported himself and lived apart from all human society; whereas the latter was a habitation where the monks lived in company, and had all things in common. The cells of the laura were called anchor-hotels, anchor-houses, and destina; and were, according to the most ancient rules of the order, to be not more than twelve feet square, to contain three windows; one for the administration of the sacrament, one for the reception of food, and one for the admission of light; and to be walled upon the anachoret from the outside, that, thus bricked up in this kind of grave, he might be the more effectually cut off from the possibility of human intercourse, and live in constant seclusion from the world. In proportion to their supposed piety, the anachorets, besides the common restrictions of the order, imposed upon themselves additional tortures, tending in their opinion to the more complete mortification of the flesh. St. Dunstan, at Glastonbury, lived in a cave of only five feet long, two and a half broad, and the height of a man. Wulfnic, of Haselborough, immerged himself in a tub of cold water every night to say the psalter. Others vowed eternal silence; and oppressed themselves by constantly wearing heavy chains, bracelets, fetters, &c. This kind of life had been growing into repute ever since the time of Simeon Stylites, about the close of the fourth century, a wretched being, who at the age of thirteen entered into a monastery, where he passed a noviciate unusually severe; and afterwards confining himself by a heavy chain, within the space of a mandarin, or circle of stones, ascended a column gradually raised from the height of nine to sixty feet, and sat upon the top of it the remainder of his life, a period of about thirty years. Crowds of pilgrims thronged around his pillar from all parts of the world, to witness so extraordinary an instance of piety; and are said to have been proud of the honour of supplying his necessities.

After his death many others affected to aspire after an equal degree of sanctity; the mountains became full of hermits; and nothing was so fashionable as retirement from the world. In the seventh century the anachorets were distinguished from the hermits, and formed into a separate order. The general councils dwelt largely on its importance, represented the subjects of it as by far the most perfect sort of monks, extolled the piety of Paul, the first who had ever devoted himself to this life of solitude, and finally modified the practice into a system, honoured by the illustrious names of St. Anthony and St. Hilarian. The people also revering their piety presented the devotees with large sums of money.

To render the order more venerable, the monks would frequently select from among themselves, in their different abbeys, a brother who was thought to be exemplary, and devote him to this unreserved seclusion as one of the most distinguished honours they could confer upon him; affording him an opportunity of showing his contempt of the world, and indulging incessantly in religious contemplation. The following, which was the usual mode of initiation into this kind of life, we copy from the Trullan canons:—

Those who affect to be anachorets shall first, for three years, be confined to a cell in a monastery; and if, after this, they profess that they persist, let them be examined by the bishop, or abbot; let them live one year at large: and if they still approve of their first choice, let them be confined to their cell and not be permitted to go out of it, but by consent and benediction of the bishop in case of great necessity.

The setting apart of a devotee was accompanied by an august ceremony; and much deep investigation as to the motives and principles by which he was actuated. A short account of this circumstance we shall insert from Fosbrooke's Monachism, 4to. 1817.

'The anachoret was to be advised by the bishop, or some other priest, to examine his conscience, whether he acted from piety sincere or feigned; and if the answer was favourable, the priest was, by order of the bishop, to shut him up. Provision was first to be made for his confession; and on the day preceding the ceremony, he received the refection of bread and water. On the night following he passed devout vigils in the church nearest the hermitage. On the morrow, after an exhortation to the people and the anachoret, the priest began a responsary; and, upon the conclusion of it, prostrated himself with his ministers before the step of the altar, and said certain psalms. After these, the mass was celebrated in the neighbouring church, and

an especial prayer said for the anachoret. After the gospel, he offered a taper, which was to burn upon the altar at the mass. The anachoret then read the schedule of his profession (which consisted only of the vows of obedience, chastity, and stedfastness), at the step of the altar; and if he was a layman, the priest read it for him. He then made a sign of his intention, and offered it upon the altar, kneeling. The priest consecrated the habit; and sprinkled that and the anachoret with holy water. Then followed mass and litany; after which they went in procession to the hermitage. The priest took him by the right hand and led him to the house, which was then blessed and shut from without. The priest, with the assistants, retired, leaving the anachoret within, and advised the by-standers to pray for him.'

ANACH'ORETTE, ANACH'ORITE, ANACHORET'ICAL, AN'CHORET, AN'CHORITE, AN'CRESS, or AN'CHORESS, AN'CRE, or AN'CHOR. — Ἀναχωρητὴς; ἀναχωρέω, to go away, to retire. One who betakes himself to solitude.

Sometime I am religious,
Now like an *anker* in an hous.
Chaucer. The Romaunt of the Rose, fol. 146. ci. 1.

And it followed (saith Maurdine) as the virgine had spoken: which virgin vowed to liue a religious life, and became an *ancresse* at Crowland.
Stowe's Chro. Howe's Ed. 1641.

Call not these wrinkles graves; if graves they were,
They were love's graves; or else he is no where.
Yet lies not love dead here; but here doth sit,
Vow'd to this trench, like an *anchorit*.
Donne's Elegy. The Autumnal.

ANACHORITA, among ecclesiastical writers, a name given to the cells of recluses, which could not be erected without consent of the bishop.

ANACHREMPSIS, in ancient medicine; from ἀναχρεμπτομαι; to strain up a purgation of the lungs by expectoration.

ANACH'RONISM, ANACHRONIS'TIC. — Ἀνὰ, and χρονος, time. Deviation from the order of time.

There are in scripture of things that are seemingly confused, carrying semblance of contrariety, *anachronisms*, metachronisms, and the like, which brings infinite obscurity to the text. *Hale's Golden Remains.*

Among the *anachronistic* improprieties which this poem contains the most conspicuous, is the fiction of Hector's Sepulchre. *Warton's English Poets.*

This leads me to the defence of the famous *anachronism*, in making Æneas and Dido cotemporaries: for it is certain, that the hero lived almost two hundred years before the building of Carthage.
Dryden.

ANACHRONISM also stands opposed to parachronism, whereby a fact is placed later and lower than it should be.

ANACHYTIS, in natural history, a species of echinus, of the second order of vermes, mollusca; it is heart-shaped, oblong, and conic; base flattish; its divisions are ten; its mouth subrotund, surrounded with an elevated margin; vent oval, and notched below.

ANACLASIS, that elevation of the arm which makes it and the humerus appear as but one bone.

ANACLASTIC GLASSES, a kind of sonorous phials, or glasses, chiefly made in Germany, which, being flexible, emit a vehement noise by means of the human breath. They are a low kind of phials with flat bellies, resembling inverted funnels, whose bottoms are very thin, not quite flat, and a little convex. Upon applying the mouth to the orifice, and gently sucking out the air, the bottom gives way with a loud noise, and from convex becomes concave. Upon respiring or breathing gently into the orifice of the same glass the bottom with no less noise bounds back to its former place, and becomes convex as before. It is to be observed that if the bottom be concave at the time of inspiration, the glasses will burst; as also if it be convex at the time of expiration.

ANACLETERIA; from ἀνὰ, and καλέω, I call; in antiquity, a solemn festival celebrated by the ancients when their kings came of age, and assumed the reigns of government.

ANACLETICUM, in the ancient art of war, a particular blast of the trumpet, whereby the fearful and flying soldiers were rallied, and recalled to the combat.

ANACLETUS, bishop of Rome, succeeded Linus in the second year of Titus, A. D. 79. He is said to have suffered martyrdom, after governing the Roman church thirteen years.

ANACLETUS, an anti-pope, set up by Roger, king of Sicily. After a violent contest with Innocent II. who was supported by the emperor Lotharius, the latter gained the papal chair, and Anacletus died in obscurity in 1138.

ANACLINOPALE; from ἀνὰ, κλίνω, I recline, and ὅπλα, arms; in antiquity, a kind of wrestling on the ground, in which the combatants fought by pinching, biting, scratching, and other such methods of offence. The Anaclinopale was contradistinguished from the Orthopale, wherein the champions stood erect.

ANACLINTERIA, in antiquity, a kind of pillows on the dining-bed, whereon the guests leaned. The ancient tricliniary beds had four pillows, one at the head, another at the feet, a third at the back, and a fourth at the breast. That on which the head lay was properly called by the Greeks ἀνακλιντήριον, or ἀνακλίντρον, by the Romans fulcrum, and sometimes pluteus.

ANACOINOSIS; from ἀνα, and κοινῶ, I communicate; communication, a figure in rhetoric, when we consult the adversary, or appeal to the judges what ought, or could have been done on such an occasion.

ANACOLLEMA; from ἀνακολλάω, to agglutinate; a composition of astringent powders, applied by the ancients to the head, to prevent defluxions on the eyes.

ANACOLUTHON; from ἀνακόλυθος, incoherent; among ancient grammarians, incoherence, or a construction which does not hang together.

ANACOMIDE, in medicine, a word frequently used by Hippocrates to denote restoration of strength after illness.

ANACONDA, in natural history, is a name

given in the Isle of Ceylon to a very large and terrible rattle-snake, which often devours the unfortunate traveller alive, and is itself accounted excellent and delicious fare. It is supposed to be the same as the boa of Linnæus.

ANACOSTE, a sort of woollen diaper made in Flanders and Holland, similar to the serges of Caen.

ANACREON, a Greek poet, born at Teos, a city of Ionia, flourished about A. A. C. 532. Polycrates, tyrant of Samos, invited him to his court, and made him share with him in his business and his pleasures; which however he afterwards quitted for Athens, where he remained in great favour with Hipparchus, until the death of his patron obliged him to return to his native city; whence he retired to Abdera on the breaking out of the disturbances under Histiæus; and died there, being choked it is said with a grape stone, at the age of eighty-five. The odes of Anacreon, says Rapin, are perpetual graces; it is familiar to him to write what is natural and to the life; and the air of his poetry is so delicate, so easy, and so graceful, that among all the ancients there is nothing comparable to them. We have but fragments remaining either of his life or works; but it appears from these that he was a voluptuary, both in practice and in principle 'at once,' as it has been well said, 'one of the many who practised what he taught, and of the few who would dare to teach all that he practised.' His poetry, for the most part in praise of wine, and of the appetites which have been so often and improperly dignified by the name of love, has been frequently translated into English. Cowley has given an excellent version of twelve of his odes; and Fawkes a literal but spiritless one of the whole of them. Mr. Young and Mr. T. Moore have made more recent attempts at a version of Anacreon, and with very different success. The production of the former is coarse and revolting; while that of the latter is not only elegant, graceful, and most harmonious, but executed in a spirit but too congenial with that of his author. We will present our readers with one extract from this fascinating writer:

Εἰς τὸ δεῖν πίνειν.

Ἡ γῆ μέλαινα πίνει,
Πίνει δὲ δένδρε' αὐτήν.
Πίνει θάλασσ' ἀναύρας,
Ὁ δ' ἥλιος θάλασσαν,
Τὸν δ' ἥλιον σελήνη·
Τί μοι μάχεσθ', ἑταῖροι,
Καὐτῷ θέλοντι πίνειν;

Ode xx.

Thus rendered by a translator in Bland's Anthology:

The black earth drinks the falling rain,
Trees drink the moisten'd earth again;
Ocean drinks the mountain gales;
Ocean's self the sun inhales;
And the sun's bright rays as soon
Are swallowed by the thirsty moon.
All nature drinks,—if I would sip,
Why dash the nectar from my lip?

ANACREONTIC VERSE, in ancient poetry, a kind of verse so called after Anacreon. It consists of three feet and a cæsura: the first is usually a spondee or iambus, sometimes an anapest: but the second and third are always iambuses. Such are those of Prudentius:

Ádēs | pătēr | sŭprē|mē,
Quēm nē|mŏ vi|dĕt ūn|quām.

ANACRISIS; from ἀνὰ, and κρίνω, I judge; among the ancient Greeks, a kind of trial or examination, concerning their family, property, &c. which the archons, or chief magistrates of Athens underwent before their admission into that office. The anacrisis performed in the senate-house, stands distinguished from the docimasia, which was a second examination in the forum. Some suppose all magistrates underwent the anacrisis.

ANACRISIS, in the civil law, an investigation of the truth, especially as made by torture.

ANACROSIS, in antiquity, the first part of the Pythian song, wherein the combat of Apollo and Python are described. It contained the preparation to the fight.

ANACTES, a title assumed by the brothers of the king of Cyprus, who administered government.

ANACTORION, in botany, another name for the gladiolus of Linnæus.

ANACYCLUS, in botany, a genus of the polygamia superflua order, and syngenesia class of plants; and, in the natural method, ranking under the forty-ninth order, compositæ discoides. The characters are: CAL. hemispheric and imbricated: COR. radiated: STAM. five very short capillary filaments: ANTHERS. cylindric and tubular: PIST. an oval germen: STYL. filiform: STIGMA, bifid in the hermaphrodites: STIGMATA double and reflected in the females: PERICAR. none: CAL. unchanged: SEEDS solitary, with membraneous wings: RECEPTACULUM chaffy. The species are: A. creticus, &c. trailing anacyclus, an annual, native of Crete. A. orientalis, eastern anacyclus, native of the East. A. aureus, golden-flowered anacyclus, an annual or perennial, native of the south or east of Europe. A. valentinus, fine-leaved anacyclus, an annual, native of Valentine. A. Alexandrinus, an annual, native of Egypt.

ANADAVADÆA, in ornithology, a barbarous name of a species of alauda. See ALAUDA.

ANADEMA, in antiquity, an ornament of the head, wherewith victors at the sacred games had their temples bound, and also worn by the Grecian women.

ANADEME, Ἀνάδημα; from ἀναδέω, to bind round. See DIADEM. A garland.

The virgin-huntress sworn to Dian's bow,
Here in this shade her quarries did bestow,
And for their nymphals, building amorous bowers,
Oft drest this tree with *anadems* of flowers.
Drayton's Owl.

ANADENDROMALACHE, in botany, the same as Althæa.

ANADENDRON, in botany, the same as Althæa.

ANADENIA, in botany; from α, without, and ἀδὴν, a gland; because the nectariferous glands usual in some neighbouring genera, are wanting. CAL. none: COR. petals four, equal, regular, their summits dilated; concave, bearing the stamens: STAM. filaments four, very short: AN

PETALS roundish: PIST. germ superior, stalked, half-ovate, erect, without any gland at the base: STYL. cylindrical, incurved: STIG. vertical, conical: PERICARP. follicle stalked, of one cell: SEED solitary, compressed, without a wing. The species are three: 1. A. pulchella, elegant anadenia; this, as well as the two following species, is a native of the south coast of New Holland. 2. A. bifida, three-cleft anadenia. 3. A. ilicifolia, holly-leaved anadenia.

ANADESMA, a bandage to bind up wounds.

ANADIPLOSIS; from *ανα*, again, and *διπλοω*, I double; in medicine, the return of the paroxysm of a fever, chiefly of a semitertian. It is also called epanadiplosis and epanalepsis.

ANADIPLOSIS, in rhetoric, a reduplication of the last word or foregoing member of a period; as, 'he retained his virtues amidst all his misfortunes, misfortunes which only his virtues brought upon him.'

ANADIPLOSIS is also frequently used in poetry, thus:

Addit se sociam timidisque supervenit Ægle,
Ægle Naiadum pulcherrima.——
————Sequitur pulcherrimus Astur,
Astur equo fidens.——

I count it higher pleasure to behold—
* * * * * * * * *
The hills and mountains raised from the plains,
The plains extended level with the ground,
The grounds divided into sundry veins,
The veins enclosed with rivers running round;
These rivers making way through natures chains,
With headlong course into the sea profound:
The raging sea, beneath the valleys low,
Where lakes and rills and rivulets do flow.

Walton.

ANADIRSKOI, a town belonging to Russia, seated on the Anadir. Long. 165° 14′. E. lat. 66° 9′ N.

ANADOSIS; from *ανὰ*, and *δίδωμι*, I give; in ancient medicine, denotes the distribution of the aliment by the vessels of the body.

ANADROME, in medicine, a recess of pain from the inferior to the superior parts of the body.

ANADROMOUS, among ichthyologists, a name given to such fishes as go from the sea to the fresh waters at stated seasons, and return back again; such as the salmon.

ANADUOMENE VENUS, in the Grecian mythology, answered to the sea Venus in the Roman, and was the appellation given to one of the chief deities of the sea. The most celebrated picture in all antiquity was that by Apelles, of this goddess coming out of the sea, wringing her wet hair. This picture Augustus bought of the Coans, and placed in the temple of Julius Cæsar. Being a little defaced in one place, no painter could be found at Rome to repair the damage. The famous Venus d' Medicis is also a Venus Anaduomene.

ANADYSIS, among ancient divines, denotes the ceremony of emersion in baptism, as distinguished from *κατάδυσις*, or immersion.

ANÆDEIA; from *ἀναίδεια*, impudence, or according to Junius, from *ἀναίτια*, innocence; in antiquity, a denomination given to a silver stool in the Areopagus, on which the defendant or person accused was seated for examination. The plaintiff or accuser was placed on an opposite stool called hybris, or injury.

ANÆSTHESIA, in medicine, a privation of the senses, and insensibility to the touch.

ANÆTHETUS, in ornithology, a name sometimes given to a species of tern found in Jamaica, the sterna solida of Linnæus.

ANAGALLIS AQUATICA, in natural history, brook-lime.

ANGALLIS, PIMPERNAL: in botany, a genus of the monogynia order, and pentandria class of plants; and, in the natural method, ranking under the twentieth order, Rotaceæ. The characters are: CAL. a quinquepartite perianth. persistent: COR. one rotated petal: STAM. five erect filaments shorter than the corolla: ANTH. simple: PIST. a globular germen: STYL. slightly declinated: STIGMA, headed: PERICARP. a globular capsule, unilocular and circumcised; seed numerous and angled; receptaculum globular and very large. There are four species, easily propagated by seeds; and when their seeds scatter, they become troublesome weeds. All the species are eaten by cows and goats, but refused by sheep; small birds feed on the seeds. Great medicinal virtues were formerly attributed to the first two species; but they are now justly disregarded. 1. A. arvensis, or common pimpernel has a red flower, and is common in cornfields, and other cultivated places in Britain. It makes a pleasant sallad, and in some places is used as a pot-herb. 2. A. fœmina has blue flowers, and is sometimes found wild in the fields. 3. A. latifolia, or Spanish pimpernel, is a native of Spain, and likewise produces blue flowers. 4. A. monelli, or narrow-leaved pimpernel, is a beautiful small perennial plant, and produces numbers of fine blue flowers. 5. A. tenella, bog pimpernel: it is perennial, and flourishes on wet heaths and bogs.

ANAGLYPHA, in ancient writers, vessels or other things adorned with sculpture in basso relievo.

ANAGLYPHICE, or ANAGLYPTICE; from *ἀναγλύφω*, exsculpo, I carve; that species of sculpture wherein the strokes or figures are prominent or embossed, in distinction from diaglyphice, where the strokes are indented.

ANAGNI, a town of Italy, situated in the Campagna di Roma, thirty-six miles east from Rome, anciently called Anagnia. Near it are the hot waters, formerly called Thermæ Anînæ. Long. 13° 45′ E., lat. 42° 48′ N.

ANAGNIA, in ancient geography, a town of Latium, capital of the Hernici; which, after a faint resistance, submitted to the Romans, and was admitted to the freedom of the city without the right of suffrage. It was afterwards a colony of Drusus Cæsar, walled round, and its territory assigned to the veterans. Here Antony struck a medal when he divorced Octavia, and married Cleopatra.

ANAGNOSES, or ANAGNOSMATA; from *ἀνὰ*, and *γινώσκω*, I know; an ecclesiastical book, in the Greek church, containing the lessons appointed for divine service.

ANAGNOSTA, or ANAGNOSTES, in antiquity, kind of literary servant, whose chief business it was to read during meals. They are first

mentioned by Cicero. Atticus, according to Cornelius Nepos, always had an agnostes at his supper; and the same custom was kept up by Charlemagne, who at table had the histories and acts of ancient kings read to him. The ancient Greeks also had the praises of their great men and heroes sung while at table. The ancient monks and clergy retained the same custom, as we are informed by St. Augustine.

ANAGOGIA, in antiquity, solemn sacrifices to Venus, at Eryx, in Sicily, where she was honoured with a magnificent temple.

ANAGO'GICKS, } 'Αναγωγή, from 'Ανάγω;
ANAGO'GICAL. } ἀνὰ ἀγω: to lead, or draw upwards. Terms used in what is styled the transcendental philosophy and theology, to denote what is calculated to elevate the mind to lofty, sublime, and mysterious speculations and contemplations.

The allegory is appropriate to fayth, and the *anagogicall* to hope, and things above.

The Whole Workes of W. Tyndall, &c. f. 166, c. i.

ANAGOGY, in medicine, the return of humours, or the rejection of blood from the lungs by the mouth.

AN'AGRAM, } Gr. ἀνὰ and γράμμα, a letter. Applied to the formation of words of a different signification by the transposition of the letters of words already in use.
ANAGRAMMAT'ICAL,
ANAGRAMMAT'ICALLY,
ANAGRAM'MATISM,
ANAGRAM'MATIST,
ANAGRAM'MATIZE.

REA. And see where Juno, whose great name
Is Unio, in the *anagram*,
Displays her glittering state and chair,
As she enlighten'd all the air.

Ben Johnson's Mas. of Hymen.

When the *anagrammatist* takes a name to work upon, he considers it at first as a mine not broken up, which will not shew the treasure it contains, until he shall have spent many hours in the search of it; for it is his business to find out one word that conceals itself in another, and to examine the letters in all the variety of stations in which they can be possibly ranged. *Spectator*, No. 60.

ANAGRAMS. Those who adhere strictly to the definition of an anagram, take no other liberty than that of omitting or retaining the letter *h* at pleasure; whereas others make no scruple to use *e* for *æ*, *v* for *w*, *s* for *z*, and *c* for *k*; and vice versâ. We meet with another kind in ancient writers, made by dividing a single word into several; thus sus tinea mus, are formed out of the word sustineamus. Anagrams are sometimes also made out of several words: such as on the question put by Pilate to our Saviour, Quid est veritas? whereof we have this admirable anagram, viz. Est vir qui adest. The Cabbalists among the Jews are professed anagrammatists. Thus, of נה, the letters of Noah's name, they make חן grace, and of משיה the Messiah, ישמה, he shall rejoice. The French are said to have had the honour of introducing the art, as it is now practised, in the reign of Charles IX.; we find the appointment of anagrammatist to Louis XIII. was worth 1200 livres per annum. Of this species of literary trifling, many examples occur. Thus, the anagram of Galenus is angelus; that of Logica caligo; that of Loraine, alerion, on which account the family of Loraine took alerions for their armoury; and that of Sir Edmunbery Godefne, (the name, or nearly, of a gentleman found murdered by the Papists, as it was alleged, in Charles II. reign, 'By Romes rude finger die!' Calvin, in the title of his Institutions, printed at Strasburg in 1539, calls himself Alcuinus, which is the anagram of Calvinus, and the name of an eminently learned person in the time of Charlemagne, who contributed greatly to the restoration of learning in that age.

ANAGRAPHE; from ἀνὰ and γραφω, I write; a register, inventory, or breviate.

ANAGROS, in commerce, a measure for grain used in some of the cities of Spain, particularly at Seville; forty-six anagros make about 101¼th quarters, London measure.

ANAGYRASIUS, in mythology, a name given, according to Suidas, to a certain hero, Agyrus, afterwards worshipped as a god; who, in revenge for an affront which an old man offered to his grove, inflamed the man's wife with a passion for his son, whose eyes he put out from jealousy, after which he hung himself; and the woman, who accused the youth falsely, threw herself into a well.

ANAGYRIS, in botany, stinking bean trefoil: a genus of the monogynia order, and decandria class of plants; and, in the natural method, ranking under the thirty-second order, papilionaceæ. The characters are: CAL. a bell-shaped perianth: COR. papilionaceous; the vexillum cordated, straight, emarginated, and twice as long as the calyx; the alæ ovate, and longer than the vexillum; the carina straight and very long: STAM. ten filaments: ANTH. simple: PIST. an oblong germen: STYL. simple: STIGMA, villous: PERICARP. an oblong legumen: seeds are six or more, and kidney-shaped. Of this genus there are three species, viz. A. fœtida, a native of the southern parts of Europe, growing to the height of eight or ten feet, and flowering in April or May. 2. A. cretica, a native of Candia and other islands of the Archipelago. 3. A. inodora, a native of Cochin-China, larger than the other species.

ANAGYRUS or ANAGYRIS, a district in Attica, of the tribe Erechtheis, so called, according to some, from the god Anagyrasius; or, according to others, because there the anagyris grew in great plenty, and the more it was handled the stronger it smelled: hence commovere anagyrum, signifies to bring a misfortune on one's self.

ANAH, a town of Diarbeck in Asiatic Turkey, pleasantly situated in a country producing abundance of corn and fruit. It stands on a stream that flows into the Euphrates, eighty miles W. N. W. of Bagdad, and 240 S. S. E. east of Diarbekir. Long. 42° 28′ E., lat. 34° 6′ N.

ANAHUAK, the original name of New Spain.

ANAITIS, in mythology, 'Αναΐτις, a goddess worshipped by the Lydians, Armenians, and Persians, whose festival was celebrated by the grossest debaucheries, for which the most beautiful of their women were selected as priestesses. Pliny says, that when the temple of this goddess at Acilisene was plundered by the Romans, under Marc Antony, her statue of massy gold was

carried off, and broken to pieces. A report prevailed, that the first man who touched the goddess, instantly fell down dead. Augustus, supping a long time after this event, with an old soldier, who had shared the plunder, questioned him concerning the truth of the fact; the latter replied, 'Cæsar, it is the goddess Anaitis's leg you are now eating for supper, and all I have in the world I owe to her.'

ANAK; ענק, Heb. i. e. a collar; the father of the Anakim, was the son of Arba, who gave his name to Kirjath-arba, or Hebron, Josh. xiv. 15. He had three sons, Sheshai, Ahiman, and Talmai, (chap. xv. 14, and Numb. xii. 22,) who, as well as their father, were giants.

ANAK SUNGEI, a district in the Island of Sumatra, on the south-west side, extending along the sea-coast, from Manjuta river to that of Urei. The chief bears the title of Sultan; and his capital is Mocomoco, a poor town. The authority of the monarch is very limited, the greater part of the country being inhabited by the native Sumatrans, under their own chiefs, who attend the sultan at certain periods, and pay him a tax or contribution.

ANALCIME, in mineralogy, cubic zeolite.—This mineral is generally found in granite, gneiss, trap rocks and lavas, at Calton Hill, Edinburgh, at Talisker in Skye, in Dumbartonshire; in the Hartz, Bohemia; and in the Ferroe Islands. From its becoming feebly electrical by heat, it has got the name analcime. Its specific gravity is less than 2.6. It consists of fifty-eight silica, eighteen alumina, two lime, ten soda, eight and a half water, and three and a half loss in 100 parts.

ANALECTA, ANALECTES; from ἀναλέγω, I gather; in antiquity, a servant whose employment it was to gather up the offals of tables, which were picked up, and not swept away, as the pavements of the Roman floors were too finely inlaid to admit of sweeping.

ANALECTA, ANALECTE, in literature, is used to denote a collection of small pieces; as essays, remarks, &c.

ANALEMMA, in geometry, a projection of the sphere on the plane of the meridian, orthographically made by straight lines and ellipses, the eye being supposed at an infinite distance, and in the east or west points of the horizon. Analemma denotes likewise an instrument of brass or wood, upon which this kind of projection is drawn, with an horizon and cursor fitted to it, wherein the solstitial coluze, and circles parallel to it, will be concentric circles; all circles oblique to the eye, will be ellipses; and all circles whose planes pass through the eye, will be right lines. This instrument is used in common astronomical problems; but is not very exact unless very large. It is also useful for laying down the signs of the zodiac, with the length of days, and other matters of furniture, upon dials.

ANALEPSIS, in medicine, the augmentation or nutrition of an emaciated body.

ANALEPSIS, in surgery, the method of suspending a dislocated arm in a string.

ANAL FIN, in ichthyology, the fin placed between the vent and tail, which expands perpendicularly.

ANALIS, in entomology, a specific name occurring in several genera in the Linnæan and Fabrician systems. It is the name: 1. Of a species of scarabeus; 2. Of a species of coccinella; 3. Of a species of chrysomela; 4. Of a species of cerambyx; 5. Of a species of cryptocephalus; 6. Of a species of staphylinus; 7. Of a species of cimex; 8. Of a species of phrygania; 9. Of a species of sphex; 10. Of a species of vespa; 11. Of a species of apis.

ANALOGISTA, in civil law, a tutor who is not obliged to give an account of his conduct.

ANAL'OGIZE, ANAL'OGY, ANALOG'ICAL, ANAL'OGOUS, ANAL'OGAL, ANAL'OGOUSLY. Ἀναλογία, from ἀνὰ and λογος. To institute a comparison; to ascertain a ratio, proportion, resemblance. The significations may be more particularly collected from the following illustrations.

He calleth the Lordes body the congregation redemed with Christes body as he dyd before, and also in the chapter followyng, fetching his *analogie* and similitude at the naturall body.

The Whole Workes of Tyndall, &c. f. 473. c. 1.

Besides the express laws of our religion, there is an universal line and limit to our passions and designs, which is called the *analogy* of christianity; that is, the proportion of its sanctity, and the strictness of its holy precepts. *Jeremy Taylor.*

There is placed the minerals between the inanimate and vegetable province, participating something *analogical* to either. *Hale's Orig. of Mankind.*

Every one knows that *analogy* is a Greek word, used by mathematicians to signify a similitude of proportions. For instance, when we observe that two is to six, as three is to nine, this similitude or equality of proportion is termed *analogy*.

Bp. Berkeley's Minute Philo.

When a word, which originally signifies any particular idea or object, is attributed to several other objects, not by way of resemblance, but on account of some evident reference to the original idea, this is peculiarly called an *analogical* word; so a sound or healthy pulse, a sound digestion, a sound sleep, are so called, with reference to a sound and healthy constitution; but if you speak of sound doctrine, or sound speech, this is by way of resemblance to health, and the words are metaphorical. *Watts's Logick.*

The unction of our Lord was the descent of the Holy Ghost upon him at his baptism. This was *analogous* to the ceremony of anointing. *Horsley's Sermons.*

ANALOGY, in philosophy. A great part of our philosophy has no other foundation than analogy. It is natural to mankind to judge of things less known by some similitude, real or imaginary, between them and things more familiar or better known. And where the things compared have really a great similitude in their nature, when there is reason to think that they are subject to the same laws, there may be a considerable degree of probability in conclusions drawn from analogy. Thus we may observe a very great similitude between this earth which we inhabit, and the other planets, Saturn, Jupiter, Mars, Venus, and Mercury. They all revolve round the sun, as the earth does, although at different distances, and in different periods. They all borrow their light from the sun, as the earth does. Several of them are known to revolve round their axis like the earth, and by that

means must have a like succession of day and night. Some of them have moons that serve to give them light in the absence of the sun, as our moon does to us. They are all in their motions subject to the same law of gravitation, as the earth is. From this general similitude, it is not unreasonable to think, that those planets may, like our earth, be the habitation of various orders of living creatures: there is even great probability in this conclusion from analogy. But perhaps no author has made so just and happy a use of this mode of reasoning as bishop Butler in his Analogy of Natural and Revealed Religion. In that excellent work, the author does not ground any of the truths of religion upon analogy, as their proper evidence: he only makes use of analogy to answer objections against them; shewing that when objections are made to religion, which may be made with equal strength against what we know to be true in the course of nature, such objections can have no weight. Analogical reasoning, therefore, may be of excellent use in answering objections against truths which have other evidence. It may likewise give a greater or a less degree of probability in cases where we can find no other evidence. But, as this kind of reasoning can afford only probable evidence at best, unless great caution be used, we are apt to be led into error by it. To give an instance of this: early anatomists seldom dissected human bodies; but very often the bodies of those quadrupeds whose internal structure was thought to approach nearest to that of the *human* body; and were led into many mistakes by their arguing on a greater similitude between the structure of men and of animals than there is in reality. Arguments drawn from analogy become weak, as the disparity between the things compared increases; and therefore must be weakest of all when we compare body with mind, because there are scarcely two things in nature more unlike. Yet is there no subject on which men have always been so prone to form their notions by analogy, as in what relates to the mind. We form an early acquaintance with material things by means of our senses, and are bred up in a constant familiarity with them. Hence we are apt to measure all things by them; and to ascribe to things most remote from matter, qualities that belong only to material things. It is for this reason that mankind have, in all ages, been so prone to conceive the mind itself to be some subtile kind of matter: that they have been disposed to ascribe human figure, and human organs, not only to angels but even to the Deity. Thus contrary motives are compared to the weights in the opposite scales of a balance; and there is not perhaps any instance that can be named of a more striking analogy between body and mind. The phrases of weighing motives, and of deliberating upon actions, are common to all languages. As the balance it is said cannot incline to one side more than the other, when the opposite weights are equal, so a man cannot possibly determine himself if the motives on both hands are equal; and as the balance must necessarily turn to that side which has most weight, so the man must necessarily be determined to that hand where the motive is strongest. And on this foundation some of the schoolmen maintained, that if a hungry ass were placed between two bundles of hay equally inviting, the beast must stand still and starve to death, being unable to turn to either, because there are equal motives to both! The principal *uses* of analogy in the investigation of physical and moral truth, according to our author, have been reduced to the four following: 1. By means of our senses to improve, first our own judgment, and afterwards that of others, with respect to intellectual subjects. 2. To deduce a general from a particular truth. Having discovered and proved the truth of a proposition with respect to any particular object, examine whether this truth flows from a quality peculiar to this single object, or common to several objects. In the latter case all these objects may be comprehended under one general idea, founded on their common quality. Substitute this general idea instead of the particular object, and the proposition will become general without ceasing to be true; because whatever evidently and solely results from the identity, on which an analogy is founded, must necessarily be true with respect to all those objects in which the analogy is the same. 3. To prove the truth or falsehood of propositions which cannot be otherwise demonstrated. 4. To discover new truths in both natural and moral philosophy.

AN'ALYZE, *v.*
ANAL'YSIS,
AN'ALYST,
ANALYT'ICAL,
ANALYT'ICALLY,
ANALYT'ICK, *n.* & *adj.*
AN'ALYZER.

'Ανὰ and λύω, to loosen. To resolve a compound substance into its elements or first principles.

What the sun compoundeth, fire *analyseth*, not transmuteth. *Brown's Hydriotaphia.*

As Stellus, late dictator of the feast,
The nose of haut-gout and the tip of taste,
Critiqued your wine, and *analyzed* your meat,
Yet on plain pudding deign'd at home to eat.
Pope's Moral Essays.

There is an account of dew falling, in some places, in the form of butter, or grease, which grows extremely fetid; so that the *analysis* of the dew of any place may, perhaps, be the best method of finding such contents of the soil as are within the reach of the sun. *Arbuthnot.*

We cannot know any thing of nature, but by an *analysis* of its true initial causes; till we know the first springs of natural motions, we are still but ignorants. *Glanville.*

To investigate truth with success, in mathematics, in natural philosophy, and, indeed, on every occasion where it is difficult to be found, the *analytic* method must be employed.
Bolingbroke's Essay on Hum. Know.

To *analyze* the immorality of any action into its last principles; if it be enquired, Why such an action is to be avoided; the immediate answer is, Because it is sin. *Norris's Miscell.*

Analytic method takes the whole compound as it finds it, whether it be a species or an individual, and leads us into the knowledge of it, by resolving into its first principles, or parts, its generic nature, and its special properties; and therefore it is called the method of resolution. *Watts's Logic.*

Analysis consists in making experiments and observations, and in drawing general conclusions from them by induction, and admitting of no objections but such as are taken from experiments, or other certain truths.
Newton's Optics.

The great work of which Justinian has the credit, consists of texts collected from law books of approved authority; and those texts are digested according to a scientifical *analysis*; the names of the original authors and the titles of their books being constantly cited.
Sir William Jones.

ANALYSIS, in chemistry, is a term applied to the process by which a separation is effected of the constituent principles of any substance: it has been divided into proximate and ultimate. When we have a compound of two or more ingredients, these ingredients themselves being also compounded, the separation of the compounds from each other has been named the proximate analysis of the body; while ultimate analysis is an expression by which is understood the separation of these compounds into their components. A further division has likewise obtained among chemists of analysis into simple or true, and complicated or false. When a body is exposed to a certain degree of heat, the principles of which it is compounded may be so far interfered with that they shall separate; and their volatility being different in degree, the one which is most volatile shall be the first to pass off or be expelled. In other cases, however, a body will resist this endeavour at separating its constituent principles by the most intense heat; but if treated with some other chemical agent, this last agent may, by combining with one of its component parts, effect the desired separation. Such, then, are instances of simple or true analysis, for in these cases the re-union of the constituent principles may be brought about by withdrawing the interfering agency, or the body may be again formed by bringing its component parts under circumstances favourable to combination: but in complicated or false analysis the composition of the compound is, as it has been expressed, not only subverted, and its individual existence destroyed, but, from the combination of its principles in new modes and proportions, it is impossible to re-produce it by the union of the products of the analysis.

It must ever be recollected that when the analysis or separation of any substance has been carried so far as possible, we arrive not properly at its absolute essence, we only detect its elements; and even this term must be carefully taken as not implying any thing more than that we are at present incapable of decomposing further. Many bodies are daily crumbling into component principles under the powerful grasp of modern science, which had long been considered as simple or elementary; and, in the expectation of still greater discoveries, there is no point at which we may stop. It may here, by the way, be incidentally remarked, that one of the great errors of ancient philosophy consisted in its unwarrantable assumption of simple elementary existence, as of air, earth, fire, and water. See CHEMISTRY.

Analysis of course is made to apply both to organic and inorganic matter; but in the former case we cannot uninterruptedly proceed beyond the proximate principles of the substance upon which our experiments are instituted; for when we attempt the ultimate separation of organic compounds, we are liable to obtain the results of an entirely new arrangement of principles, or an arrangement different from that presented to us by the hand of nature. In this case, then, we cannot always, as in bodies of the mineral kingdom, proceed from a knowledge of their components to the actual formation of the substances themselves. It is not probable, indeed, that we shall ever attain the power of imitating nature in these operations. For in the functions of a living plant a directing principle appears to be concerned, peculiar to animated bodies, and superior to, and differing from, the cause which has been termed chemical affinity. So it is, and with somewhat still of more force and complication, in the animal world; for chemical agency applied to animal substances gives origin to a set of bodies which had no existence in the subject of experiment, the ultimate elements of which are thus disunited, and are recombined in a new manner. Bones, for example, though they contain no volatile alkali, are yet composed in part of its elements (nitrogen and hydrogen) which at a high temperature unite and generate ammonia. See AMMONIA.

On especial analysis we shall have to treat in the article CHEMISTRY, and the composition of the several materials that come under the cognizance of chemical science will be incidentally stated as these substances fall before us for consideration in alphabetical order: we shall in this place confine ourselves to remarking that very considerable improvements, and apparently much nearer approximations to truth, have lately taken place in reference to the analysis even of those materials which in their aggregate are the result of organic agency. The object of these improved methods to which we now refer, and which are equally applicable to vegetable and animal substances, is to convert the whole of the carbon which enters into their composition into carbonic acid, and the whole of their hydrogen into water, by means of some compound containing oxygen in so loose a state of union, as to give it up to those bases at the temperature of ignition. The oxygen too, contained in these bodies, may be detected by examining what quantity of oxygen has been lost by the oxide employed to effect decomposition; and if this fall short of the oxygen contained in the carbonic acid, and in the water, then the quantity required to make up the amount must have previously existed in the subject of analysis. In a few vegetable substances, moreover, and in all animal ones, azote or nitrogen exists as a component, and its quantity requires to be determined. With a proper attention to the details of the process, this fourth element may be obtained in the condition of gas, which remains after absorbing the carbonic acid by solution of potass, and the oxygen, if any, by a fit agent.

Gay Lussac and Thenard, to whom we are principally indebted for the processes now adverted to, first employed as their agent the chlorate of potass, but the former chemist subse-

quently substituted the peroxide of copper, especially in the analysis of animal compounds. The mode of applying this substance to effect the objects intended we shall describe in another place; see CHEMISTRY: it may be here sufficient to state, that all the analyses which have been performed by these improved methods, conspire to make us believe that the elements of organized, like those of inorganic matter are united in definite proportions; and further, that the laws of simple multiples hold strictly with respect to the elements of organic bodies. See ATTRACTION and ATOMIC THEORY.

Under the term mineral, it is usual to comprehend all those substances which are not the results of organization; and for the purposes of analysis a division has been proposed of these substances into earths, salts, inflammable fossils, and metals with their ores; difficulty of solution being the characteristic of the first, comparatively easy solubility of the second, inflammability of the third, and the fourth are characterized by a high degree of specific gravity, metallic lustre, malleability, fusibility, &c. But the line of distinction between these substances is not capable of being drawn out with accuracy or precision; indeed, the recently detected metallic base of the earths and some of the saline class would be sufficient to prove that the above division, however convenient for the purposes of analytical examination, can lay no claim to absolute rectitude.

Increase of temperature, minute division of different materials, admixture, and more recently voltaic electricity, are the principal agents employed for resolving minerals into their constituent elements; and we shall have occasion in the article CHEMISTRY to dwell upon the very important improvements lately introduced into the science, in reference to these particulars. Under the word MINERAL also, this subject will be resumed and enlarged upon. The mode of analyzing mineral waters will be treated of particularly in the article WATERS; and the means of detecting and analyzing those materials that are regarded as poisonous (an enquiry which has lately much occupied the attention of physicians and chemists) will be discussed separately and at large under the head of POISONS.

ANALYSIS, in literature, is also used for a kind of syllabus, or table of the principal heads or articles of a continued discourse, disposed in their natural order and dependency. Analyses are more scientifical than alphabetical indexes; but they are less used, as being more intricate. Analysis is likewise used for a brief, but methodical, illustration of the principles of a science; in which sense it is nearly synonymous with what we otherwise call a synopsis.

ANALYSIS, in mathematics, is properly the method of resolving problems by means of algebraical equations; hence we sometimes find that the two words analysis and algebra are used as synonymous. Or, Analysis may be distinguished into the ancient and the modern. The ancient analysis is the method of proceeding from the thing sought as taken for granted, through its consequences, to something that is really granted or known. The principal authors on the ancient analysis, as recounted by Pappus, in the seventh book of his Mathematical Collections, are Euclid in his Data, Porismata, & de Locis ad Superficiem; Apollonius de Sectione Rationis, de Sectione Spatii, de Tactionibus, de Inclinationibus, de Locis Planis, & de Sectionibus Conicis; Aristæus de Locis Solidis; and Eratosthenes de Mediis Proportionalibus: from which Pappus gives many examples in the same book. To these we may add Pappus himself. This kind of analysis has also been successfully cultivated by many moderns; as Fermat, Viviani, Getaldus, Snellius, Huygens, Simpson, Stewart, Lawson, &c. and more especially Hugo d'Omerique, in his Analysis Geometrica, in which he has endeavoured to restore the analysis of the ancients. Dr. Pemberton says, that 'Sir Isaac Newton used to censure himself for not following the ancients more closely than he did; and spoke with regret of his mistake, at the beginning of his mathematical studies, in applying himself to the works of Des Cartes, and other algebraical writers, before he had considered the Elements of Euclid with that attention so excellent a writer deserves: that he highly approved the laudable attempt of Hugo d'Omerique to restore the ancient analysis.' In the application of the ancient analysis to geometrical problems, every thing cannot be brought within strict rule; nor any directions given, by which we may succeed in all cases; but some previous preparation is necessary, a kind of mental contrivance and construction, to form a connection between the data and quæsita, which must be left to every one's fancy to find out; being various, according to the various nature of the problems proposed: right lines must be drawn in particular directions, or of particular magnitudes; bisecting perhaps a given angle, or perpendicular to a given line; or perhaps tangents must be drawn to a given curve, from a given point; or circles described from a given centre, with given radius, or touching given lines, or other given circles; or such-like other operations. Whoever is conversant with the works of Archimedes, Apollonius, or Pappus, well knows that they founded their analysis upon some such previous operations; and the great skill of the analyst consists in discovering the most proper affections on which to found his analysis: for the same problems may often be effected in many different ways; and that which leads to the conclusion by the most obvious and satisfactory steps, is the one which ought to be adopted. Modern analysis consists chiefly of algebra, arithmetic of infinities, infinite series, increments, fluxions, &c.; which form a kind of arithmetical and symbolical analysis, depending partly on modes of arithmetical computation, partly on rules peculiar to the symbols made use of, and partly on rules drawn from the nature and species of the quantities they represent, or from the modes of their existence or generation.

The modern analysis is a general instrument by which the finest inventions and the greatest improvements have been made in mathematics and philosophy, for near two centuries past. It furnishes the most perfect examples of the manner in which the art of reasoning should be

employed; it gives to the mind a remarkable skill in discovering things unknown, by means of a small number that are given; and by employing short and easy symbols for expressing ideas, it presents to the understanding things which otherwise would seem to lie above its sphere. By this means geometrical demonstrations are greatly abridged: a long train of arguments, in which the mind cannot without the greatest effort of attention discover the connection of ideas, is converted into visible symbols; and the various operations which they require, are simply effected by the combination of those symbols. And, what is still more extraordinary, by this artifice a great number of truths are often expressed in one line only; instead of which, by following the ordinary way of explanation and demonstration, the same truths would occupy whole pages or volumes. And thus, by the bare contemplation of one line of calculation, we may understand in a short time whole sciences, which otherwise could hardly be comprehended in several years. From a comparison of the peculiar natures of the ancient and modern analysis, it results that the ancient method may, in some respects, be regarded as more perspicuous than that of the moderns; though the latter be far superior to it in point of despatch and facility of invention: that the former is the most proper for one who is entering upon mathematical pursuits, as it will accustom him to a pure, clear, and accurate mode of investigation, and demonstration; but that the modern analysis should be recommended to his attention, as soon as proper habits of reasoning are established, because he may thereby be enabled to extend his views, and to strike out new improvements and discoveries. Or, adopting the conclusion of a late judicious writer on this subject, we may say, that, 'if mental discipline and recreation are sought for, they may be found in both methods; neither is essentially inaccurate; and, although in simple enquiries the geometrical has greater evidence, in abstruse and intricate investigations the analytical is most luminous; but, if the expeditious deduction of truth is the object, then the analytical calculus ought to be preferred. To arrive at a certain end, we should surely use the simplest means; and there is little to praise or emulate in the labours of those who resolutely seek truth through the most difficult paths, who love what is arduous, because it is arduous; and, in subjects naturally difficult, toil with instruments the most incommodious.' *Phil. Trans.* 1822, part I.

Analysis Residual is a branch of the algebraic art, invented by the late Mr. John Landen, and applied to the solution of those problems which have, of late, been more generally solved by the doctrine of fluxions. This method was called the residual analysis, because, in all cases where it is made use of, the conclusions are obtained by means of residual quantities. In this analysis a geometrical or physical problem is reduced to another purely algebraical; and the solution is then obtained without any supposition of motion, and without considering quantities as composed of infinitely small particles. The residual analysis proceeds by taking the difference of the same function of a variable quantity in two different states of that quantity, and expressing the relation of this difference to the difference between the two states of the said variable quantity itself. This relation being first expressed generally, is then considered in the case when the difference of the two states of the variable quantity is $=0$.

Mr. Landen published the first book of his Residual Analysis in 1764, and therein exemplified its usefulness in several algebraic enquiries, and in determining the tangents, evolution, ordinates, points of contrary flexure, double and triple, &c. points, asymptotes, centres, &c. of curve lines. In the second book it was intended to show the application of this analysis in a variety of mechanical and physico-geometrical enquiries: but that book was never published. Analysis of powers is the same as resolving them into their roots, and is otherwise called evolution. Analysis of curve lines shows their constitution, nature, and properties.

Analytic Method. The analytic method in logic stands opposed to the synthetic. In natural philosophy, as in mathematics, the investigation of difficult things by the analytic method ought to precede the method of composition. It consists in making experiments and observations, and in drawing general conclusions therefrom by induction; and admitting of no objections against the conclusions, but such as are drawn from experiments and other certain truths: and though the reasoning from experiments and observations by induction be no demonstration of general conclusions, yet it is the best method of reasoning of which the nature of things admits, and may be esteemed so much the stronger as the induction is more general; and, if no exception occur from phenomena, the conclusion may be pronounced general. By this way of analysis, we may proceed from compounds to their ingredients; from motions to the forces producing them; and in general from effects to their causes, and from particular causes to more general ones, until we arrive at those which are the most general. This is the analytic method according to the illustrious Newton. The synthetic method consists in assuming the causes discovered and received as principles, and by them explaining the phenomena proceeding from them, and proving the explanations. See Synthesis.

ANAM, a town of Hindostan, in the province of Oude, district of Lucknow, from the capital of which it is distant thirty-five miles W.S.W. N. lat. 25° 32′, E. lon. 80° 29′.

ANAMABOA. See Annamaboa.

ANAMANI, Anamanes, or Amanes, in ancient geography, were friends and allies of the Romans, who inhabited Cisalpine Gaul, at the foot of the Apennines to the south of the Po, having Trebia to the west, and Tarus for their principal rivers. In the extent of their country were found Placentia, Veleia, Florentia, and Julia Fidentia.

ANAMBAS, a cluster of islands in the China Sea, the largest of which is only twenty miles in circumference. They are situated about lat. 3° N., long. 106° 50′ E.

ANAMIMS, according to Bochart, were the people that dwelt in the parts adjacent to the temple of Jupiter Ammon, and in the Nasamonites. Calmet thinks the Amanians and Garamantes were descended from the Anamims.

ANAMMELECH, an idol of the Sepharvaites, who are said in Scripture to have burnt their children in honour of Adrammelech and Anammelech. These idols probably signified the sun and moon.

ANAMNESEIS, (from *ἀνὰ* and *μνάομαι*, I remember) in ancient authors, denote encomiums of persons who behaved well in war, or on other occasions, rehearsed before the emperors of Constantinople.

ANAMNESTICS, or Rememoratives, in medicine, signs which tend to discover the preceding state of a patient's body, in opposition to Prognostics, which give an idea of the future. The word is also applied to spirituous and other medicines for restoring the memory.

ANAMORPHOSIS, in perspective drawing. See Optics, Index, and Perspective.

ANANAS, in botany, the trivial name of a species of bromelia. See Bromelia.

ANANCÆON, in rhetoric, *ἀναγκαῖον*, a figure by which what is necessary only is expressed, to the exclusion of all ornament.

ANANCITIS, in antiquity, a kind of figured stone, otherwise called synochitis, celebrated for its magical virtue of raising the shadow of the infernal gods.

ANANCS, three small islands in the Grecian Archipelago, about nine miles S. W. of the island of Milo.

ANANES, in music, the ancient term for the modes of the Greek church.

ANANIAS, the son of Nebedeus, a high-priest of the Jews about A. D. 48. His treatment of Paul, when brought before him, recorded in Acts xxiii. 2, sufficiently characterises him as a partial and unjust judge.

ANANISABTA, or Ananisapta, a magical word, frequently found inscribed on coins and amulets, supposed to have a virtue of preserving the wearer from the plague.

ANANTAPOTODON, in rhetoric, a figure in which some part is understood.

ANANTPOOR, a town in the Balaghant ceded territory, district of Wandicotta, fifty-five miles S. E. from Bellary. Lat. 14° 42′ N., long. 77° 40′ E.

ANANURI, a fortress and small town of Georgia, in the district of Sseristo, situated on the rivulet Arkala. The fortress consists of a quadrangular wall, eighteen feet high, with round towers at the corners. It contains three churches. The houses are pits, six feet deep, lined internally with wood, and the roof level with the ground. In the middle is an aperture for the admission of light and exit of the smoke. Forty miles N. N. W. of Teflis.

ANAPA, a fortified town of Circassia, on a bay of the Black Sea, called Sundjik Bay. It is about two miles in circuit, has a good harbour, and carries on a considerable trade. The fort was built in the year 1784 by the Turks. A Turkish pacha, residing at Tschutchukelee, or Sudshuck-chalah, another fortified town, about sixteen miles distant, was made governor. The Russians took Anapa by storm in 1791, when it had nothing but ramparts of earth; but when restored to the Turks they fortified it with a strong wall: both this town and the other now belong to the Russians. Distant seventy miles E. S. E. of Theodosia. Long. 37° 10′ E., lat. 44° 40′ N.

ANAPÆST, in ancient poetry, a foot consisting of two short syllables and one long: such is the word ănĭmŏs. It is the reverse of the dactyl.

ANAPHE, in ancient geography, an island in the Cretan Sea, near Thera, now called Nansio. Its name is derived from the sudden appearance of the new moon to the Argonauts in a storm. Apollo was worshipped here by the title of Anaphæus.

ANAPHORA, *ἀναφορὰ*, in rhetoric, a figure, when several clauses begin with the same word, or sentence; as, The voice of the Lord is powerful: the voice of the Lord is full of majesty: the voice of the Lord breaketh the cedars; yea, the Lord breaketh the cedars of Lebanon: the voice of the Lord divideth the flames of fire: the voice of the Lord shaketh the wilderness, &c.

Anaphora, in astrology, the second house or that part of heaven which is 30° distant from the horoscope.

Anaphora, in ecclesiastical writings, the host offered in the eucharist. It is also used to denote the rehearsing a person's name from the diptyches in the liturgy. It is likewise a title given to those Syriac liturgies, wherein are contained the prayers after the osculum pacis. Ignatius, patriarch of the Marionites, enumerates forty of these anaphoræ.

ANAPHORODISIA; from *α* and *Ἀφροδίτα*; impotence, or want of power to procreate. See Impotence.

ANAPHUS, in entomology, a species of papilio, in the division plebeii urbicolæ, inhabiting Surinam. It has no tail, and is uniformly brown, except the apex of the lower wings, which is yellow.

ANAPLASIS; from *ἀνὰ* and *πλάσσω*, I form; in surgery, the complete restitution of a broken bone, so that the two ends meet, and close exactly together. It is also called diaplasis. Anaplasis also signifies a renutrition of extenuated flesh.

ANAPLEROSIS, in surgery, denotes repletion. It is more particularly used to signify that part of surgery whereby things wanting are supplied; in which sense anaplerosis amounts to the same with prosthesis.

Anaplerosis, in the civil law, is a name which some give to the four last books of Justinian's Code.

ANAPLEUSIS, in medicine, *ἀνάπλευσις*, the exfoliation or rotting away of the bones from redundance of humours.

ANAPPES, a town and district of French Flanders, on the river Marque, in the arrondissment of Lisle. It is distant six miles from Lisle. Population 2000.

ANARCHI, *Ἄναρχοι*, in antiquity, a name given by the Athenians to four supernumerary days in their year, during which they had no magistrates, or rather were employed in electing new ones. The Attic year was divided into 12

parts, according to the number of tribes, to whom the precedency of the senate fell by turns. Each division consisted of thirty-five days; what remained after the expiration of these, to make the lunar year complete, which, according to their computation, consisted of 354 days, were employed in the creation of magistrates.

AN'ARCHY, *n.* / ANARCH'ICAL, / ANARCH'ICK, / AN'ARCHISM, / AN'ARCHIST, / AN'ARCH. — A, without, *ἀρχὴ*, beginning. Hence denoting the evils occasioned by the absence of first principles. Confusion, mismanagement. Particularly applied to the want of laws essential to social order.

All France swarmed with dissolute soldiers of sundry nations, which having no generall made hauocke at their pleasure. They were called people without an head, and by innumerable insolencies made the wretchednesse of *anarchy* apparent.

Speed's History of Gt. Britain.

Where eldest Night
And Chaos, ancestors of Nature, hold
Eternal *anarchy*, amidst the noise
Of endless wars, and by confusion stand. *Milton.*

Arbitrary power is but the first natural step from *anarchy*, or the savage life; the adjusting power and freedom being an effect and consequence of maturer thinking. *Swift.*

But is not freedom—at least is not ours
Too apt to play the wanton with her pow'rs,
Grow freakish, and o'erleaping ev'ry mound,
Spread *anarchy* and terror all around.

Cowper's Table Talk.

ANARGYRI, in ecclesiastical history, an appellation given to saints of the Greek church, who, having been physicians, gave not only their advice, but their remedies, gratis. They are also called argentinopes.

ANARGYRUS; from *a*, and *ἄργυρος*, money; in ancient writers, denotes a person without ready money, though possessed of land and other effects.

ANARHAPHE, (from *ἀνὰ*, and *ῥαφὴ*, suture,) in surgery, denotes a kind of suture or retraction of the upper eyelid, when relaxed and hanging over the eye; called also sutura blepharica.

ANARRHICAS, in ichthyology, a genus of fishes, of the order of apodes. There is but one species of this genus; sometimes, however, divided into two or three, according to their size, viz. lupus, or sea-wolf: which seems to be confined to the northern parts of the globe, and is found in the seas of Greenland, Iceland, and Norway; on the coasts of Scotland and of Yorkshire; and in that part of the German Ocean which washes the shores of Holland. It is a ravenous and fierce fish; and, when taken, fastens on any thing within its reach; the fishermen dreading its bite, endeavour as soon as possible to beat out its fore teeth, and then kill it, by striking it behind the head.

ANARRHINON, in botany, the name given by Pliny and some of the ancients to the Lychnis agria.

ANARRHŒA, in medicine, a species of fluxion, wherein the humours regurgitate upwards; and so opposed to catarrh.

ANARRHEGNIMIA, or ANARRHEXIS; in medicine; from *ἀνὰ*, again, and *ῥήγνυμι*, to break; a fresh fracture or opening of a wound.

ANARROPIA, among physicians, a tendency of the humours to the head or superior parts.

ANARTHRA; from *a*, and *ἄρθρον*, a joint; a class of naked insects, distinguished by having neither wings nor limbs. To this class belong all kinds of worms and leeches.

ANAS, in ancient geography, a river of Spain, now the GUADIANA, (which see,) rising in the ancient Laminium, now the province of La Mancha.

ANAS, in ornithology, a genus of birds belonging to the order of anseres. The beak of this genus is a little obtuse, covered with an epidermis or skin, gibbous at the base and broad at the apex: the tongue is obtuse and fleshy, and the feet are webbed. There are ninety-eight different species, besides many varieties described by ornithologists. Of these the following are the principal: viz.—1. A. aborea, or black-billed whistling duck of Edwards, of a reddish brown, with a sort of crest on the head; the belly spotted with black and white; a native of America. 2. A. acuta, pin-tail, or sea-pheasant of Ray, which has a long accumulated tail, black below, with a white line on each side of the back part of the head. It is a native of Europe. 3. A. americana, American wigeon, le canard jensen of Buffon, rather bigger than our wigeon. 4. A. anser, the goose. We shall only describe two of this numerous species, the anser ferus, or wild goose, and the anser mansuetus, or tame goose. (1.) A. anser ferus, the wild goose or gray lag, is two feet nine inches in length, and five feet in extent. The bill large and elevated, of a flesh colour, tinged with yellow; the head and neck cinereous, breast and belly whitish, clouded with gray of an ash colour; back, gray; the legs of a flesh colour. This species resides in fens, and towards winter collects in great flocks. On the continent they are migratory. (2.) A. anser mansuetus, or tame goose, is the gray lag in a state of domestication, and from which it varies in colour, though much less so than either the mallard or cock, being ever more or less verging to gray; though in all cases the whiteness of the vent, and upper tail coverts, is manifest. They are frequently found quite white, especially the males. In general it breeds only once a year, and is said to be very long-lived. Geese are sometimes plucked five times in the year, and vast numbers are driven annually to London. 5. A. bernicla, of a brown colour, with the head, neck, and breast black, and a white collar. It frequents our coasts in winter, and those of Holland and Ireland, where they are taken in nets placed across the rivers. They fly in the shape of a wedge, and with great clamour. They are common also in America. 6. A. boschas, common wild duck of Ray, or mallard; the intermediate tail feathers of the drake are turned backward, and the bill is straight. 7. A. canadensis, brown; its neck and head black, and the throat white. It measures three feet and a half in length, and is found during the summer in Hudson's Bay, and parts beyond; in Greenland; and in the summer months in various parts of North America, as far as Carolina. This species is now pretty common, in a tame state, both on the Continent and in

England, where they are thought a great ornament to the pieces of water in many gentlemen's seats. 8. A. candida, the snow goose, is in length two feet eight inches, and weighs between five and six pounds. The bill is somewhat serrated at the edges; the upper mandible scarlet, the lower whitish; the general colour of the plumage is snow white, except the first ten quills, which are black with white shafts; the legs of a deep red. The young are blue till they are a year old. These are very numerous at Hudson's Bay, and called by the natives way-way, and wapha-whe-whe. They visit the Severn in May, and stay a fortnight, but go farther north to breed. They return to the Severn Fort the beginning of September, and stay to the middle of October, when they depart for the south, and are attended by their young in amazing flocks. 9. A. casarca, or ruddy goose, is larger than a mallard, and seems even larger than it really is, from its length of wing, and standing high on its legs. This species is found in all the southern parts of Russia and Siberia. In winter it migrates into India, and returns northward in spring. The flesh is thought very delicate. 10. A. clangula, or golden eye of Ray, variegated with black, white, and blackish green feathers; it has a white spot near the mouth, and the eyes are of a shining gold colour. It is not unfrequent on our sea-coasts in winter, and appears in small flocks; but passes to the north in spring, in order to breed. It inhabits Sweden and Norway during the summer, is an excellent diver, and feeds on small shells. It has been attempted to be domesticated, but seems out of its element on land. 11. A. clypeata, or shovelar of Ray, has the end of its bill broad, rounded, and furnished with a small hook. It is in length twenty-one inches, the female smaller. Both sexes vary much in colour: the male likewise differs from the female inwardly, having just above the divarication of the windpipe, where it passes into the lungs, an enlargement, or, as it is called by some, a labyrinth. These birds are sometimes, though not very commonly, met with in England. It is found in most parts of Germany, and throughout the Russian dominions, and in North America, in New York and Carolina during winter. 12. A. creca, or common teal, has a green spot on the wings, and a white line both above and below the eyes, is fourteen inches in length, and frequent in the London markets along with the wild duck. In France it stays through the year. It is found to the north as high as Iceland; and inhabits the Caspian to the south. 13. A. cursor, the race-horse or loggerhead goose, is in length thirty-two inches, and weighs from twenty to thirty pounds. It inhabits the Falkland Islands, Staaten Land, &c., and is mostly seen in pairs. 14. A. cygnoides, has a semicylindrical bill, gibbous wax, and tumid eyebrows. It is the swan goose of Ray, from Guinea. There is likewise a variety of this species, of a less size, called the goose of Muscovy. This species inhabits China, and is common at the Cape of Good Hope. 15. A. cygnus, or the swan. Of this species there are several varieties, of which we shall only mention two, viz., the ferus and the mansuetus. (1.) A. cygnus ferus, or the wild swan, has a semicylindrical black bill, yellow wax, and a white body, is the whistling or wild swan of English authors, and is less than the tame or mute species, being about five feet in length. What is most remarkable, is the peculiar figure of the windpipe, which falls into the chest, then turns back like a trumpet, and afterwards makes a second bend to join the lungs. It thus is enabled to utter a very loud and shrill note. It is from this species that the ancients have drawn the fable of the swan being endued with the powers of melody. The eggs are accounted good food; and the flesh, especially that of the young, is much esteemed. (2.) A. cygnus mansuetus, or mute swan, the largest of British birds. It is found wild in Russia and Siberia, and is held in high veneration by the Mahommedans. It is a very strong bird, and, when fierce, has been known to throw down and trample under feet youths of fifteen or sixteen years of age. It is also very long-lived. No bird, perhaps, makes so inelegant a figure out of the water, or has the command of such beautiful attitudes on that element, as the swan. Almost every poet, indeed, has taken notice of it, particularly Milton. 16. A. erythropus, or laughing-goose of Edwards, is a native of Europe and America. Its length about two feet four inches. It visits the fens during winter in small flocks, and disappears by the middle of March. Linnæus makes this goose the female of the bernacle; but Mr. Pennant thinks his opinion not well founded. 17. A. fabalis, the bean-goose, is two feet seven inches in length; in extent four feet eleven inches. This species arrives in Lincolnshire in autumn, and retreats to the north of Europe in May. It is called the bean-goose, from the likeness of the nail of the bill to a horse-bean. 18. A. ferina, pochard, dun-bird or red-headed wigeon of Ray, has a lead-coloured bill. It is a fen bird of England; and brought up to the London markets in considerable numbers. 19. A. fuligula, or tufted duck of Ray. This species is throughout the north of Europe. 20. A. fusca, the brown or velvet duck, has a white spot behind the eyes, and a white line on the wings. The male is distinguished by a gibbosity at the base of the bill. It is the black duck of Ray, in length about twenty inches, and frequents Hudson's Bay in summer, where it breeds. It is now and then seen on the coasts of England, but more frequently on the continent, in Denmark and Russia. 21. A. galericulata, or Chinese teal of Edwards, a most singular and elegant species, a native of China and Japan, where it is kept by the inhabitants for the sake of its beauty. It is known in Japan by the name of kimnodsui. The English in China give it the name of mandarin duck. 22. A. glacialis, or long-tailed duck. These birds breed in the most northern parts of the world, and only visit our coasts in the severest winters. 23. A. histrionica, or dusky-spotted duck of Edwards; inhabits from Carolina to Greenland. In winter it seeks the open sea, flies high and swiftly, and is very clamorous. 24. A. magna, the great goose, of a very large size, weighing near twenty-five or thirty Russian pounds. It is found in the east of Siberia, from the Lena to Kami-

schatka; and is taken in great numbers. 25. A. marila, or scaup duck, less than the common duck. These birds are said to take their name from feeding on scaup, or broken shell fish; they differ infinitely in colours, so that in a flock of forty or fifty there are not two alike. 26 A. mersa, or Ural duck of Pallas, somewhat bigger than the common teal. This species is not unfrequent in the greater lakes of the Ural mountains, and the rivers Ob and Irtisch. It is not seen on the ground, as from the situation of its legs it is unable to walk. 27. A. minuta, or little white and brown duck of Edwards, found both on the old and new continents, but seldom in large rivers or waters. 28. A. mollissima, or eider duck, is double the size of the common duck, has a cylindrical bill, and the wax is dilated behind, and wrinkled. The feathers, which are very soft and valuable, fall off during incubation. The male is white above, but black below and behind; the female greenish. This species is found in the Western Isles of Scotland, and on the Faro Isles: but in greater numbers in Norway, Iceland, and Greenland; and yields the down known by the name of eider or eider. In America this bird is found as far south as New York, and breeds on the desert isles of New England; but is most common everywhere to the north. They are very numerous in the Esquimaux lands, where and in Greenland they are called mettek. 29. A. moschata, or Muscovy duck of Ray, is a native of India. The name arises from their exhaling a musky odour, which proceeds from the gland placed on the rump in common with other birds. 30. A. nigra, the black goose, or scoter, has a gibbosity at the base of the bill; the tail resembles a wedge: the female is brownish. It is the lesser black diver of Ray, and is found on the northern coasts of England and those of Scotland in the winter season: also on the French coasts, in prodigious numbers. 31. A. querquedula, garganey, or first teal of Aldrovandus, has a green spot on the wings, and a white line above the eyes. It frequents the fresh waters of Europe, and in many places it is called the summer teal. 32. A. ruficolis, or red-breasted goose, is in length twenty-one inches; weight 3 lbs. Boy. Bill is small, and brown; the tail black; the irides yellow-brown; fore part of the head and crown black, passing backwards in a narrow stripe quite to the back. On the breast is a narrow band of white feathers with black ends, forming a band of white, and another of black. The sides are striped with black; back and wings black, the last even with the tail; legs black. This most elegant of geese is found to breed from the mouth of the Ob, along the coasts of the Icy Sea, to that of the Lena. 33. A. spectabilis, the gray-headed duck of Edwards, and the king duck of Pennant. This beautiful species is found at Hudson's Bay, at Churchill River, and, though scarce, at York Fort; in winter it is met with as far south as New York. It is pretty frequent in the north of Siberia and Kamtschatka, and on the coast of Norway. 34. A. sponsa, or summer duck of Catesby, is a most elegant species. It inhabits Mexico, and some of the West India Isles, and is often kept tame in our menageries. 35. A. strepera, or gad-wal, has the wings variegated with black, white, and red. It inhabits England in the winter months, and is in various parts of France and Italy. It migrates as far as Sweden, to breed; and is found throughout Russia. 36. A. tadorna, or shieldrake, has a flat bill, a compressed forehead, a greenish black head, and the body variegated with white. This species is found as far north as Iceland. 37. A. tetrax, or campestris, though it bears the name of anas, does not belong to this genus. It is common in France, where it is also called canne petriere. It runs very swiftly, and sits on the ground as the duck does in the water, whence it has its name, Anas.

ANASARCA, in medicine; from *ἀνὰ*, through, and *σὰρξ*, flesh; a species of dropsy from a serous humour, spread between the skin and flesh, or rather a general accumulation of lymph in the cellular system. 1. Anasarca serosa, when the discharge of serum is suppressed. 2. Anasarca oppilata, when the blood-vessels are considerably pressed, which happens to many pregnant women. 3. Anasarca exanthematica, which occurs after various eruptive disorders, and particularly after the erysipelas. 4. Anasarca analmia, when the blood is rendered extremely poor from considerable losses of it. 5. Anasarca debilium, when feebleness is induced by long illness.

ANASCHOVADI, in botany, the elephantopus scaber of Linnæus.

ANASSAS, in natural history, a fruit very common in Guinea, and other parts of Africa. It is said to be very beautiful to the eye, and no less agreeable to the taste and smell. From the descriptions given of it, which are very imperfect, it appears to be a species of the pine-apple.

ANASSUS, or ANAXUS, in ancient geography, a river in the territory of Venice, now called the Piave, which, rising from the mountains of Tyrol, not far from the borders of Carinthia, runs from north to south through the territories of Cadorina, Belluno, Feltre, and, after running from west to east through Trevigi, falls into the Adriatic fifteen miles to the south-east of Venice.

ANASTASIOPOLIS, in ancient geography, the name of five cities; one in Syria, another in Phrygia, a third in Caria, a fourth in Galatia, and a fifth in Thrace.

ANASTASIS, a term among ancient physicians, for the passage or migration of any humour from one part to another.

ANASTASIUS I. emperor of the east, succeeded Zeno A.D. 491. The Manicheans and Arians were alike in hopes of being supported by the new emperor; the former, because his mother was their friend; and the latter, because the emperor's uncle was of their opinion: but he was distinguished by his moderation in regard to all the contentions of this kind which agitated the church during his reign, and banished Euphemius and Macedonius because he considered them to trespass upon this principle. In his civil government he bears a high character. He repealed a very heavy tax, called chrysargyrum, under which the people had long groaned; he prohibited the barbarous custom of fighting with wild beasts, raised several useful public buildings, and avoided being involved in dangerous wars.

Before his advancement his temperance and integrity were so well known, that, upon his receiving the diadem in the circus, the people exclaimed with one voice, 'Reign, Anastasius, as you have lived.' Anastasius reigned twenty-seven years and about a quarter, and died July the 10th, A. D. 518, in the eighty-eighth year of his age.

ANASTASIUS II., whose proper name was Artemius, was raised to the throne of Constantinople from the station of a secretary, by the free voice of the senate and Roman people. He was deposed by Theodosius, also a person of low birth, in 719, when Leo was emperor. Anastasius, renewing his claim to the throne, was, with his chief associates, put to death by that prince.

ANASTASIUS, surnamed Bibliothecarius, a Roman abbot, keeper of the Vatican library, and one of the most learned men of the ninth century, assisted in 869 at the fourth general council, the acts and canons of which he translated from the Greek into Latin. He also composed the lives of several popes, and other works; the best edition of which is that of the Vatican, 4 vols. fol. 1718.

ANASTATIA, St., a small island on the coast of East Florida, south of Mastances inlet, and north of St. Augustine's bar.

ANASTATICA, in botany, the Rose of Jericho: a genus of the siliculosa order, belonging to the tetradynamia class of plants; and, in the natural method, ranking under the thirty-ninth order, siliquosæ. The characters are: CAL. a perianth, consisting of four leaves, persistent: COR. four cruciform petals: STAM. six subulated filaments the length of the calyx: ANTHERÆ roundish: PIST. a small bifid germen: STYLUS mucronated and oblique: STIGMA headed: PERICARP. a short bilocular filicle, retuse, and crowned on the margin with valvulæ twice as long as the partition: SEEDS solitary and roundish. Of this genus there are two species. 1. A. hierochuntica, a native of the sandy parts of Palestine and the Red Sea; a low annual plant, dividing into many irregular woody branches near the root. When the seeds of this plant are ripe, the branches draw up and contract; so that the whole plant forms a kind of ball or globular body, which will expand on laying it a short time in warm water. This property it retains for many years, on which account it is preserved as a curiosity by some people; and from this the monks have given it the name of Rosa Mariæ, pretending that the flowers open on the night in which our Saviour was born. 2. A. Syriaca, a native of Syria, not cultivated or known in Britain.

ANASTATICA, in natural history, a species of vorticella, in the fifth order of vermes, infusoria. It is compound, with bell-shaped flowers; footstalks scaly and rigid: Linnæus and Mull. It is the second species of clustering polype described by Trembley.

ANASTOICHIASIS, in chemistry, a resolution of bodies into their first principles.

ANASTOMOSIS, in medicine, *ἀνατόμωσις*; from *ἀνὰ* and *τομω*, to close the mouth; an opening of the mouths of the vessels for the discharge of any fluid, as the menses, which are discharged by anastomosis into the uterus; also the inosculation of vessels, or the opening of one vessel into another; as of the arteries into the veins.

ANASTOMOSIS, in entomology, a species of phalæna of the bombyx tribe.

ANASTROPHE, in rhetoric; *ἀναστροφή*, a preposterous placing, from *ἀναστρέφω*; a figure whereby words which should have been precedent are postponed.

ANASTROPHE, in the ancient military art, denotes the return of a battalion to its former station, after an evolution to the right or left. It stands opposed to the epistrophe.

ANASTROUS SIGNS, in astronomy, an appellation given to the duodecatimoria, or twelve portions of the ecliptic, which the signs possessed anciently, but have deserted, by the precession of the equinoxes.

ANASUS, or ANISUS, in ancient geography, now the ENS, a river of Germany, which see.

ANATAJAN, or ANATACAN, one of the Ladrone islands, about ten miles in circumference It is high and mountainous, of productive soil, but destitute of fresh water, and uninhabited. Long. 145° 50′ E., lat. 17° 20′ N.

ANATASE, in mineralogy, octohedrite, oxide of titanium rutile, and titane rutile. It is the titanum ruthila of Linnæus. This mineral shows a variety of colours by reflected light; from indigo to red-brown. It appears a greenish-yellow by transmitted light, and is found usually in small octohedron crystals; and, in France, in granite, gneiss, &c.

ANATES, in medicine, a disease of the anus.

ANATH'EMA, ANATH'EMATISM, ANATH'EMATIZE, ANATH'EMATIZER, (*Ἀνὰ*, otherwise *ἄνω*, up, and *τίθημι* to put or place, to suspend or hang up, (as a votive offering.) Hence a person or thing devoted to, or set apart for, the service, or the vengeance of the Divinity; in which latter sense it is to be more commonly understood. In conformity with which signification it often means the curse pronounced on the excommunicated.

If a man be gracious and courteous to strangers, it shows he is a citizen of the world, and that his heart is no island cut off from other lands, but a continent that joins to them: if he be compassionate towards the affections of others, it shows that his heart is like the noble tree that is wounded itself when it gives the balm: if he easily pardons and remits offences, it shows that his mind is planted above injuries, so that he cannot be shot: if he be thankful for small benefits, it shows that he weighs men's minds, and not their trash: but, above all, if he have St. Paul's perfection, that he would wish to be an *anathema* from Christ, for the salvation of his brethren, it shows much of a divine nature, and a kind of conformity with Christ himself. *Bacon's Essays.*

Above all examples is that of the Jews, who put to death the Lord of life, and made their nation to be an *anathema* for ever until the day of restitution. 'His blood be upon us, and upon our children.' *Bp. Taylor's Sermons.*

Her bare *anathemas* fall but like so many *bruta fulmina* upon the schismatical; who think themselves shrewdly hurt, forsooth, by being cut off from the body, which they choose not to be of. *South's Sermons.*

ANATHEMA, in pagan antiquity, was an offering or present made to some deity, and hung up in

the temple; see the etymology of the word above. Whenever a person left off his employment, it was usual to dedicate his tools to the patron deity of his calling or profession. Persons too who had escaped from imminent danger, as shipwreck or the like, or had met with any remarkable instance of good fortune, testified their gratitude by some present of this kind. Thus the shepherd would dedicate his pipe to Pan, the fisherman his net to Neptune, the retired soldier his shield to Mars, and the by-gone beauty her mirror to Venus.

ANATHEMAS were only directed in the primitive church against notorious offenders; the form of that pronounced by Synecius against one Andronicus is as follows: 'Let no church of God be open to Andronicus; but let every sanctuary be shut against him. I admonish both private men and magistrates, to receive him neither under their roof nor to their table; and priests more especially, that they neither converse with him living, nor attend his funeral when dead!' Several councils have pronounced anathemas against such persons as they thought corrupted the purity of the faith; and their decisions have been couched in the following form: 'Si quis dixerit, &c. anathema sit.' There were two kinds of anathemas, one judiciary, and the other abjuratory. The former was denounced by a council, a pope, or a bishop; the latter made a part of the ceremony of abjuration; the convert being obliged to anathematize the heresy he abjured.

ANATHOTH, a hamlet of Palestine, about three miles and a half north of Jerusalem; the ruins of which are still to be seen. It was the birth-place of the prophet Jeremiah.

ANATHYMIASIS, *ἀναθυμίασις*, Gr., in chemistry, an exhalation or evaporation.

ANATICULA, a diminitive of anas, used by the old Roman authors as a term of fondness or affection. It signifies literally, my little duck. There is another of the same kind from a different bird, *Palambula*.

ANATIFERA CONCHA, the trivial name of a species of the lepas, a testaceous animal. See LEPAS.

ANATINA, in conchology, a species of mya, found on the shores of Guinea, and other parts of Africa, and bearing some affinity to the solen anatinus. Also a species of ostrea, that inhabits the Nicobar islands.

ANATINUS, in conchology, a species of solen, found on the sandy shores of the Indian Ocean, and named by Rumphius rostrum anatis. Likewise a species of mytilus, very common in the rivers of England, and known by the name of duck, or small horse-muscle. *Donov. Brit. Shells.*

ANATOCISM; anatocismus, Lat. *ἀνατοκισμὸς*; an usurious contract, wherein the interest arising from the principal sum is added to the principal itself, and interest exacted upon the whole. It is in fact an ancient name for compound interest. This was reckoned the worst kind of usury, and severely condemned by the Roman and common law. Yet after all, it is difficult to discover wherein the injustice lies, in taking interest upon interest, any more than in taking it upon the principal. It is allowed on all hands, that the creditor who lends money may exact the interest the day it is due, and lend it out as a principal sum to another person, or to the same person, if he makes a new contract for it; in which case, the interest just drawn bears interest anew, and thus compound-interest arises. 'Compound interest,' says Dr. Paley, 'though forbidden by the law of England, is agreeable enough to natural equity; for interest detained after it is due, becomes, to all intents and purposes, part of the sum lent.' *Moral Philosophy*, vol. i. p. 160.

ANATOLIA, a province of Turkey. See NATOLIA.

ANATOLIUS, bishop of Laodicea, was a native of Alexandria, and flourished under the emperors Probus and Carus. He succeeded Eusebius about the year 270, and was undoubtedly a Christian long before he became bishop; for he was upon terms of intimate friendship with Eusebius about the year 263, when Bruchium, or Pyruchium, one of the quarters of Alexandria, was besieged. See ALEXANDRIA. Eusebius speaks of him as having, with universal consent, pre-eminence above all the magistrates or senators of Alexandria that were in Bruchium. Soon after this Anatolius left Alexandria for Syria; and was ordained bishop by Theotecnus of Cæsarea, and appointed his colleague; but in his way to a council at Antioch he was detained at Laodicea, and appointed bishop of that city. Anatolius, though not an extensive author, was eminent for his learning, and a distinguished ornament of the Christian church. A work of his on Easter, entitled The Paschal Canon, is cited by Eusebius; and an ancient Latin version of it, said to be Rufinus's, was published by Ægidius Bucherus, in folio, at Antwerp, in 1634. Of his ten books of Institutes of Arithmetic, extracts are preserved in a collection, entitled Theologumena Arithmetica; and some fragments of his philosopical writings are collected by Fabricius; from which it appears, that, after the example of Pythagoras, Plato, and Aristotle, he made mathematical learning subservient to philosophy. This learned Alexandrian concurred with other Christians in a high respect for the scriptures of the Old and New Testament. The time and manner of his death are not certainly known; but some have supposed that he died a martyr. *Euseb. Hist. Eccl.* lib. vii. c. 32. p. 284. ed. Vales. *Cave's H. L.* vol. i. p. 136. *Fabr. Bibl. Gr.* lib. iii. c. 11. tom. ii. p. 273—278. *Brucker's Hist. Phil.* by Enfield, vol. ii. p. 306. *Lardner's Works*, vol. iii. p. 265—269.

ANATOMY.

ANAT'OMIZE, *v.*
ANAT'OMY,
ANAT'OMIST,
ANATOM'ICAL,
ANATOM'ICK,
ANATOM'ICALLY.

'Ανὰ, through, and τέμνω, to cut. To reduce the whole to its constituent parts by cutting. Chiefly applied to the dissection of the human subject; when that of a mere animal is meant, the epithet comparative is prefixed to the word.

Our industry must even *anatomize* every particle of that body, which we are to uphold. *Hooker.*

I speak but brotherly of him, but should I *anatomize* him to thee as he is, I must blush and weep, and then must look pale and wonder. *Shaksp.*

It is proverbially said, *Formicæ sua bilis inest, habet et musca splenem*; whereas these parts *anatomy* hath not discovered in insects. *Brown's Vulg. Err.*

Then dark distinctions reason's light disguised,
And into atoms truth *anatomized*. *Denham.*

Hence when *anatomists* discourse,
How like brutes' organs are to ours;
They grant, if higher powers think fit,
A bear might soon be made a wit;
And that, for any thing in nature,
Pigs might squeak love odes, dogs bark satire.
Prior.

Anatomists adjudged, that if nature had been suffered to run her own course, without this fatal interruption, he might have doubled his age. *Howel.*

When we are taught by logic to view a thing completely in all its parts, by the help of division, it has the use of an *anatomical* knife, which dissects an animal body, and separates the veins, arteries, nerves, muscles, membranes, &c. and shows us several parts which go to the composition of a complete animal. *Watts's Logic.*

There is a natural, involuntary distortion of the muscles, which is the *anatomical* cause of laughter, but there is another cause of laughter which decency requires. *Swift.*

It is therefore in the *anatomy* of the mind, as in that of the body; more good will accrue to mankind by attending to the large, open, and perceptible parts, than by studying too much such finer nerves and vessels as will for ever escape our observation. *Pope.*

1. ANATOMY, the art of dissecting an organized body for the purpose of ascertaining the shape, structure, situation, connexion, and general fabric of its several parts. The uses, moreover, of the parts thus discovered, constitute one, and indeed the main, object of the science and art in question; but, strictly speaking, anatomy itself comprises merely the structure of living beings, while physiology investigates their functions.

2. Anatomy has usually been divided into Human and Comparative: the first, as its name implies, confining its researches to the human body; the second, comprehending the whole animal creation. Recently, however, a more philosophical division has been proposed of anatomical science into Animal and Vegetable; and in consistency with this arrangement we have above defined the art to be that of dissecting organized bodies; organized being an adjective term, which comprehends all substances that possess vital properties, as opposed to inanimate matter.

3. For the most part anatomical and physiological science have been blended, even in those treatises which nominally profess to limit themselves to one department. We think, however, with a modern author of great eminence, that a more strict division of these two branches of enquiry is productive of material advantage to either. 'The descriptive detail of the structure of living bodies (this division being adopted) is no longer distracted and obscured by superficial and unconnected views of their functions; nor their functions carelessly discussed in the form of occasional and uninstructive commentaries on the descriptions of their structure. Each is made the subject of separate and particular investigation; and not only has anatomy been thus rendered more accurate and precise, but a more regular and philosophic form has been given to physiology, and its progressive improvement rendered more sure.'

4. In the present article we shall treat of anatomy as the term is vulgarly applied, viz. Human Anatomy. Under COMPARATIVE ANATOMY we shall give the anatomy of other animals; and in the article BOTANY, pursue the enquiry into the vegetable creation, leaving the functions of these respective departments of organized nature to be investigated both generally and in detail, under the comprehensive word PHYSIOLOGY.

HISTORY OF ANATOMICAL SCIENCE.

5. What Celsus says of medicine may perhaps, with the same propriety, be predicated of anatomy, 'nusquam non est:' it must always have been in existence, since the curiosity natural to mankind, with the practices of the very earliest ages in reference to the slaughter of beasts for sacrifices and other purposes, could not have failed of eliciting some information, however rude and imperfect, on the subject of animal structure and function. In the progress of time the circumstances of war, and the various methods of slaying criminals, would tend to promote and facilitate the acquisition of anatomical knowledge; but it is next to impossible to fix the precise period at which anatomy first began to be regularly studied as a branch of science.

6. Certain it is that prior to the time of Homer some progress had been made in its study: various passages in the writings of that poet imply that this was the case, and even prove that he himself had some knowledge of the body's structure. Machaon and Podalirius, sons of Esculapius, are stated by Homer to have accompanied the Greeks in their attack upon Troy: these individuals would communicate to others what they had learnt from their parent, and gathered in the progress of their own observations; and thus by the time that Homer wrote, anatomy would have advanced to some extent.

7. The writings of the early Grecian philosophers and historians, Plato and Xenophon in

particular, prove that the structure of the human body formed part of their philosophical investigations; and there is a passage in the works of the former that contains, to say the least of it, an intimation of the motive powers of the heart; he indeed calls this organ the spring or fountain by which the blood is impetuously conveyed through conduits, like those which are drawn through gardens, and thus is nourishment carried to every part of the body.

8. But it is into the writings of Hippocrates that the enquirer must look for the most ample information of the time to which we now allude on the subject of anatomy. This great man employed every means in his power to acquire a knowledge of the structure and functions of the body; and he is generally thought to be the first who wrote systematically on anatomy as a branch of the medical art. His description of the human bones is considered to this day tolerably correct, although he only once had the opportunity of seeing a skeleton; but his account of other parts and organs are, as must necessarily have been the case, highly imperfect. He does not, for instance, distinguish accurately between nerves, arteries, veins, and tendons; and he conceives the heart and lungs to be in part the immediate receptacle of the fluids that are taken in by the mouth.

9. After the time of Hippocrates the science continued to advance with no very rapid steps, impeded as it was by the prejudices and superstition of mankind. Athens and Alexandria became the two schools for Grecian education, and in the former Aristotle and Theophrastus were exceedingly conspicuous: shortly, however, after their time the cultivation of all branches of natural science fell into disrepute at Athens; the studies subservient to elocution being those only to which much attention was given; and anatomy of course shared the fate of other collateral knowledge.

10. But while science declined in Greece it flourished in Alexandria under the patronage and protection of the Ptolemies; and in this school Erasistratus and Herophilus became highly distinguished by the zeal and success with which they cultivated anatomy. They possessed, and they were probably the first to possess uninterruptedly, opportunities for actual dissection of human bodies; and they consequently had it in their power to correct many errors of their predecessors, whose opportunities for observation were so much more limited.

11. The early history of the Roman empire does not furnish any accounts of anatomy having been particularly attended to in that celebrated city. The first Greek physician established in Rome was Archagathus; and about a century afterwards, in the time of Pompey, Asclepiades became conspicuous. Cassius, who succeeded to him, and who is commonly thought to have been his disciple, was the first to speak of the crossing of the nerves from the brain. In the writings of Rufus, Cœlius Aurelianus, Aretæus, Pliny, and others, we meet with remarks on anatomy in connexion more especially with medicine; but the era to which we are now alluding is not to be regarded as taking a very prominent station in the rank of anatomical discoveries.

12. The celebrated Galen revived and systematized anatomical lore to an astonishing degree; but without, as it appears, the advantage which his great predecessors Erasistratus and Herophilus had enjoyed of dissecting freely the human subject; so that many of his descriptions of parts are taken from the inferior animals. He describes however the brain and its membranes, presents a view of the whole nervous system, connects the organization with the functions of the eye, the ear, &c. traces the contents of the thorax and abdomen, gives the origin and insertion of muscles, and a full system of osteology.

13. The works of this great man continued to be the standard of appeal for a considerable length of time, not much advance being made by means of new cultivators of the science: at length Greek and Roman learning was overwhelmed by the barbarism of the conquering nations from the north. Arabia became now the seat of learning, and the Greek authors were translated into the Arabic languages. This was occasioned by the Saracenic invasion of Spain, and by the destruction of Alexandria. In the general way, however, the Arabians limited themselves, as far as anatomical science was concerned, to translating and commenting upon their great authorities, so that very little advance was made for a considerable length of time. About the commencement of the thirteenth century Abdollatiph, however, exposed many of Galen's errors in respect to the form of the bones, by visiting the burial-grounds and comparing the description with the reality; yet he seems to have had no idea of dissecting a fresh subject, being probably prevented by the prevailing prejudices of the times, which prejudices indeed continued in preventive force until the revival of European learning.

14. At length appeared the great Vesalius, who commenced his laborious and ambitious career early in the sixteenth century. This celebrated man was the first fully to expose the errors of Galen; and he did this to such an extent, and with such freedom, that many of his contemporaries began to complain of him as innovating and ostentatious, rather than really desirous of improvement. The disputes that thence arose between Vesalius and his rivals occasioned mutual appeals to the human body, and thus did the controversy assist very materially the progress of anatomical learning.

15. About the year 1540 Vesalius gave to the world his anatomical plates, which, while they called forth much admiration, excited likewise, as we have above intimated, much envy and opposition. Sylvius of France, and Eustachius of Italy, with several other anatomists of repute, declared themselves public enemies of Vesalius, and accused him of misrepresentation, arrogance, and even impiety. Fallopius, who had been a pupil of Vesalius, conducted his opposition to some of the tenets of his master with much more moderation and liberality, and Vesalius sensible of the difference between the opposition of Fallopius, and that of Sylvius especially, replied to him in the same spirit of moderation and forbearance. In spite of all opposition Vesalius continued to increase in renown, and the empe-

ror Charles V. conferred on him the honour of appointment to be the first physician, and kept him always at court; when an unfortunate occurrence took place, which deprived him of all his honours; although afterwards, upon the death of Fallopius, he was called by the senate of Venice to fill the chair, which then became vacant: he was shipwrecked on his voyage to Padua, on the island of Zante, and there actually perished with hunger. He died in the year 1564, in the fiftieth year of his age. The event to which we have alluded, was his having opened the body of a Spanish gentleman, whom he had attended in sickness, it having been asserted by some of the persons present that the heart was seen to palpitate upon being laid bare.

16. From the time of Vesalius the value of actual dissection came to be appreciated, though still opposed by the prejudices of the people; from this time anatomical science assumed a new aspect, and soon diffused itself far and wide. Fallopius and Eustachius, contemporaries with Vesalius, the one by his Observationes Anatomicæ published at Padua, the other by his Opuscula Anatomica published at Venice, proved themselves great proficients in the science. The larger plates of Eustachius were not presented to the world till more than a century and a half after his death; they were at length discovered and published by the pope's physician, Lancisi, with a description of his own (Lancisi's) appended to them, the writing of Eustachius not having been found.

17. In the year 1616 Dr. Harvey gave an entirely new complexion to anatomical researches by teaching the doctrine of the blood's circulation: it is not in place here to enter into the grounds upon which this great reformation of the science was suggested and substantiated; suffice it to say, that it has been considered by far the most important advance that has ever been made in the knowledge of animal functions, and that it was soon followed by the discovery of the lacteal vessels, a discovery which tended to confirm and establish the greater one of Harvey. It was Asellius, an Italian physician, who first gave an account of the lacteals, in a work published in 1627; and in 1651 Picquet, in France, traced these vessels to the thoracic duct, and thence into the circulation. Rudbec and Bartholine, the latter a Danish, the former a Swedish anatomist, almost simultaneously detected the existence of the lymphatics, very soon after the discovery of the thoracic duct; and from that time to the present anatomical science has been pursued with abundant ardour and large success.

18. The very recent improvements it has undergone, having however more particular connexion with physiological discovery and speculation, the subjects which such improvements involve, together with the dates of the discoveries and the names of the discoverers, will fall to be noticed and commented on with more propriety in other parts of our work. We shall therefore here close our history of the science, and proceed to treat of its several parts in the order suggested by the celebrated anatomist whom we have above adverted to as having taught the propriety of separating anatomical description from physiological discussion; at least we shall take his arrangement for our general directory, occasionally making those deviations that may suit incidental purposes. The individual to whom we refer is the late Dr. Gordon of Edinburgh.

We shall first then treat of anatomy generally, and afterwards enter into detail.

Of the Progress of the Body from the Period of Conception.

19. Soemmering has represented the changes from the first to the fifth month of impregnation in an admirable series of engravings. In these representations an embryo of three or four weeks appears to the naked eye somewhat like a mustard seed just commencing to shoot out; the head appearing like the body of the seed, and the trunk, &c. like the radicle. But with a magnifying glass a little dark circle is perceptible in the region of the eyes, and a small slit corresponding to the orifice of the mouth. On the trunk four little prominences are observable in the situation of the four extremities; and between the two lower there is a curious prolongation like a tail, which has been named the coccygeal protuberance.

20. At about seven weeks from conception the form of the body is quite apparent. Two small pores are seen in the region of the nose; and the superior extremities seem divided into the arm and fore-arm.

21. In an embryo of eight weeks a small pore is discoverable by the microscope in the region of each auricle; a shoulder, arm, fore-arm, and hand, with five small tubercles in the situation of the fingers, can be easily distinguished with the naked eye; and, in the lower extremities, parts can be seen corresponding to the thigh, leg, and foot; but the toes do not yet appear.

22. At the end of nine weeks there is a protuberance in the region of the nose; part of the auricles is formed; the toes have appeared; the pudenda begin to be distinguished, and the coccygeal protuberance disappears.

23. The younger the fœtus the larger is its head compared with other parts, the smaller its face in proportion to other parts of the head, and the smaller its limbs relatively to the trunk. During the first, second, and third months the upper extremities are larger than the lower; about the fourth they are equal; towards the fifth the lower have become larger than the upper. Hair generally begins to appear on the eye-brows, and in the region of the head and temples, about the end of the fifth month; but in respect of this particular there is much variation.

24. The male fœtus differs from that of the female, in having its head larger in proportion to the body, less rounded, flatter in the crown, and more prominent behind. In the male the breast is much more prominent than the umbilical region, while the reverse is the case in the female. The trunk of the body between the upper parts of the loins is arched in the male, but hollow in the female. The upper extremities of the male are longer; the arms less cylindrical; the fore-arms fuller; the wrists broader; and the ends of the fingers less pointed. At the haunches

the circumference of the body is less in the male than in the female; the thighs are more slender; the feet longer; the malleoli and heels more prominent; and the great toe exceeds the others much more in length. All these distinctions it will be observed correspond in embryo with what is more fully developed in after life.

Of the Progressive Stature of the Body.

25. According to Soemmering the most rapid increase of the fœtus takes place during the first weeks after conception. It does not, however, grow in a uniform ratio; it is a little retarded during the second month; accelerated during the third; again somewhat retarded at the beginning of the fourth; from the middle of the fourth to the sixth, again accelerated; and from this period to the end of the ninth month, once more retarded.

26. The average dimensions of the male and female differ even in the fœtal state. The mean length of sixteen male children, born at the full time, was 20$\frac{19}{20}$ inches; and of eight female children, only 20$\frac{1}{2}$.

27. At the period of maturity the mean height of the male is about five feet eight inches; that of the female about five feet five inches.

Weight of the Body.

28. The average weight of the fœtus in the earlier months is uncertain; it has been stated to be about two ounces in the twelfth week, about one pound in the sixth month, and about four or five pounds troy in the eighth month. About seven pounds avoirdupois is stated to be the mean weight at birth. The difference between the weight of the male and female, at birth, is about nine ounces. In cases of twins it has been observed, that the combined weight is greater than that of a single child, but the weight of each twin less. There are, however, exceptions to this last rule.

29. The writer from whom we extract the above statements remarks, that he has examined a register of the weights of about fifty full-grown males of the average stature, and finds their mean weight to be about one hundred and forty pounds English troy. The average weight of an equal number of adult females, he supposes, would be found to be about thirty or forty pounds less.

30. We now proceed to take a general survey of the body's structure: and we shall first remark, anatomically, on the Circulating Organs, the Absorbent or Assimilating Organs, and the Nervous System. We shall then go on to speak of the *Textures* which enter into the composition of the frame under the denominations of Muscle, Tendon, Bone, Cartilage, Cellular Substance, Adipose Substance, Membrane, Skin, and Hair.

Circulating System.

31. The circulating system is constituted by the heart, the arteries, and the veins; the first of which,

32. The *heart*, is a body composed of muscular and membranous substance, in some measure of a conical form, and situated transversely at the lower part of the chest. It is divided into two cavities, or ventricles, which are separated from each other by a fleshy septum: these ventricles are vulgarly called right and left; but they are, more properly speaking, anterior and posterior, or pulmonic and systemic. Each of these ventricles has two orifices: one communicating with its corresponding auricle, or sac, at the basis; the other being the commencement, or root, of the large arteries; the pulmonaic, or that going to the lungs from the right ventricle; the aorta, or that supplying all the parts of the body from the left ventricle.

33. Many experiments have been instituted for the purpose of ascertaining the capacities of these ventricular cavities, but they are all liable to fallacy; in some of those most to be relied on, it was found that the right ventricle of an adult heart contained two ounces and a half of water, while the left held two ounces.

34. All the external surface of the heart is covered with serous membrane, and this membrane is thicker and stronger at the auricles than elsewhere.

35. Under this membrane, on some parts of the heart's surface, adipose substance is seen shining through it, giving to the heart at these parts a straw colour.

36. And under both these textures is situated what is called the muscular coat of the organ; and within this, lining the whole surface of the heart, is found the inner membrane; which last is exceedingly thin, perfectly transparent, and without any appearance of fibrous structure. Neither blood-vessels, absorbents, nor nerves, have yet been detected in it. In some parts of the right auricle, and through the whole of the left, this inner membrane is described as of a different character; being here whiter, and considerably thicker and stronger, than serous membrane, and being connected to the muscular coat by cellular substance.

37. The most important peculiarity of the fœtal heart is the oval hole found in the septum which divides the two auricles; the communication however, between the auricles through it, is not direct; for if we examine the heart of a fœtus about the fourth month, we shall find that there is a thin pellucid membrane laid over the oval hole like a valve, on the side next the left auricle. The insertion of this valve below, is into the very edge of the lower third of the oval hole itself; but, above this, its attachment is into the surface of the septum, next the left auricle, extending farther and farther out from the margin of the hole as it ascends. When it gets on a level with the upper border of the hole, it begins to incline inwards again, and after running a short way stops, leaving a free curved edge, turned upwards and a little to the left.

38. As this valve, then, is longer than the oval hole, it is obvious that if it were stretched tight across it, like the parchment of a drum, it would prevent all communication between the auricles. But it is twice as broad as the space included within the line of its insertion, so that it admits of being pushed a considerable way towards the cavity of the left auricle. When this is done, a short canal is formed between the

upper part of the valve, another portion of the septum immediately above the oval hole, opening into the left auricle by an orifice, of which the floating edge of the valve forms fully two-thirds. The axis of this canal corresponds exactly with the axis of the inferior vena cava.

39. Whether there be any period prior to the fourth month, at which the oval hole has no valve, or at which it is smaller, we have not had satisfactory means of ascertaining. But Haller mentions that his friend Bergen had found none in a fœtus of two months; and Senac believes that there is none prior to this at least; and expresses himself certain, that if its rudiments exist in two months, they are extremely small. After this period, according to him, it grows by degrees, and its margin approaches nearer and nearer to the upper border of the hole.

40. It is very probable that this description is correct; but as we have found that the valve even in the fourth month is very easily broken, unless the heart be dissected with great care, nothing but actual observation will satisfy us on this point.

41. The hole and the valve are pretty nearly in the state we have described, until about the commencement of the ninth month, when a considerable change begins to take place. The valve becomes thicker and tighter, and its free margin narrower; consequently the passage between the auricles becomes smaller. The sides of the hole itself are at the same time thickened. The valve at last becomes so much tighter, and its upper border so much narrower, that the parts assume the appearance of the oval fossa, with a small slit at top as already described. How long this process is in being completed we have not ascertained; but we suspect, from an examination of several hearts, that it is not until two or three months after birth at least.

42. We have gone rather more into detail in reference to this point than may be considered consistent with the general view which we now profess to give; but we knew not how better to present the reader with a view of this main difference between the fœtal and adult heart, than by copying the above statement of it from Dr. Gordon; the reader may reperuse it after he shall have read the more particular description of the heart which will be found in the second division of the present article. We shall also refer to it when treating on the adult and fœtal circulation under the head of PHYSIOLOGY.

43. The fœtal heart has its auricles larger in proportion to the ventricles than is the case with the adult. The whole of the right and left side of the organ are more in correspondence than after birth, the left side being probably rather the largest.

44. The *Arteries*.—The arterial system has been compared to the trunks and branches of two trees. One of these trunks, the pulmonary artery, arises, as we have above said, from the right ventricle of the heart; the other, the aorta, from the left. They are both about an inch and a quarter in diameter; and their sides about a twelfth of an inch thick. Immediately after their origin they begin to ramify; and by successive ramifications the whole body is at length supplied with blood.

45. The terminations of arteries have been described by anatomists as many; for instance, they are said to end in open capillary vessels which pour out a fluid, into surfaces internal and external, in glands, in cells; but it is only their termination into the venous system that is capable of absolute demonstration. Other terminations are rather inferred than proved.

46. Different anatomists have described the coats of these vessels in a different manner: while some have contended that the whole tube is constructed of nothing but cellular tissue, others have contended for the existence of five separate layers or tunics. The most accredited anatomists, however, consider their coats as three, an inner, middle, and outer one.

47. The inner coat is considerably like that which we have said lines the heart, but is more elastic. The middle coat is the thickest, and it is composed of slender fibres, laid closely together, surrounding the artery. If the inner coat be peeled off from the artery, the fibres of the middle tunic may be raised with the forceps in successive strips. The outer coat consists of slender white shining fibres, very dense and tough, closely compacted together, and so interwoven that they cannot be separated and made to peel in any regular manner.

48. The cellular coat of arteries, which some anatomists have added to the others, cannot with propriety be deemed such; for it is not universally present, and is rather therefore an accidental and partial than a proper and peculiar covering.

49. The very small arteries are supposed from analogy to consist of the same parts as the larger ones: even when, from their minuteness, this cannot be demonstrated: some have considered them more fibrous and less membranous than the larger branches.

50. The *Veins*.—In describing the ramifications of these, it is usual to invert the order observed in tracing the arteries, and to consider the trunks as successively formed by the union of the branch. By microscopic observations upon a well-injected subject, we can see minute veins arising from equally minute arteries; and this is the only origin of veins that has been actually demonstrated. They are supposed, like the terminations of arteries, to have several other modes and points of communication. In the large veins two coats can be distinctly shown; and, in some, portions of a third texture intervene between these two.

51. The inner coat of veins, although transparent like that of the arteries, is a little thicker and much stronger; and it is separable into dense slender fibres. The outer coat is, like that of the arteries, fibrous; but its fibres are not so close, and the whole structure of the coat is thinner than that of the artery.

52. In most of the larger branches of veins a substance is found between the two proper coats; but it does not always completely surround the vessels. It is much thicker in some parts than in others. Its texture is said to be intermediate between the external and middle coat of an artery.

Absorbent System.

53. When treating on Physiology we shall have to state that a difference of opinion obtains among anatomists, even in the present day, in reference to the organs subservient to the function of absorption. As our present business, however, is mere description, we shall limit ourselves in this section to the mention of lymphatic vessels and glands; the first of which are, a system of tubes distributed throughout the body in the manner of the blood-vessels. Like the veins, the lymphatics are observed at first as exceedingly minute tubes; their commencement, however, has never been shown to the naked eye. Cruikshanks once finding the absorbents of the alimentary canal after death tinged with a milky fluid, (here indeed this system of vessels takes the name of *lacteals*), traced vast numbers of them to their origin, which seemed like circular orifices. But it is only in this part of the body that the commencement of these vessels has been detected even with the aid of the microscope.

54. The structure of the *lymphatics* is not so susceptible of demonstration as is that of the veins; but they are supposed to consist of one coat only, similar to the inner coat of the veins, the valves, which are very numerous in these vessels, seeming to be mere prolongations of their coat. The termination of the absorbents is into the thoracic duct on the left side, which empties its contents into the left subclavian vein; of this, however, we are to speak more particularly afterwards, as well as of another occasional termination of these vessels.

55. The *glands* of the absorbents, or, more properly speaking, the absorbent glands, consist of a peculiar substance enclosed in a capsule: this capsule is a thin and pellucid membrane without colour, but very vascular and resolvable by maceration into fine whitish fibres. The lymphatics before entering a gland divide, according to Mascagric, into branches. Some of these penetrate directly into the central parts of its substance, while others are distributed towards its surface. The larger branches are bent, convoluted, and interwoven in every direction; they communicate freely with each other, and become suddenly narrow in some parts, while they swell out into little cells at others; so that when the gland is injected with quicksilver, its whole outer surface seems as if covered with little round eminences. The smaller branches subdivide, and form a net-work on the surface, and then either dip down between the cells of the larger ones or open into them. Various small vessels, on the other hand, are seen either arising from these cells, or ascending from between them, and, after winding about, uniting together into larger branches, which at last constitute the vasa afferentia. Sometimes the absorbent vessels of a gland preserve a pretty uniform diameter throughout, so that there is little or no appearance of cells in any part of it.

Nervous System.

56. In treating of the nervous system, anatomists generally speak of the brain and spinal cord, as the central mass; and then of the nerves as in a manner proceeding from these. In the article Physiology it will, however, be seen that somewhat different views have lately been taken of the connexion between the several portions of the nervous organization.

57. *Brain.*—The average weight of the brain is from two and a half to three pounds avoirdupois. There is some variety in this, but not in proportion to the stature or weight of the individual. It is divisible into two halves, which are very nearly alike. It is divided into the upper portion, or *brain proper*, or cerebrum; and the lower one called *cerebellum*. The weight of the first is from thirty-five to forty ounces; and of the last from five to eight. The brain is made up almost entirely of a peculiar substance that has been called nervous matter, embraced by delicate membranes. This nervous matter has been divided into white, and brown or cineritious. The white matter of the brain has recently been described as fibrous. Other anatomists have, from microscopic observations, stated it to consist of extremely small globules, having the appearance of cells, filled with proper medullary substance. The white nervous matter is said by some to possess considerable vascularity; others deny that the vessels go beyond the fine investing membranes of the brain.

58. The brown nervous matter is softer than the white; it is said, however, to be in like manner with the white globular when examined with the microscope. These two kinds of matter are intermingled in the brain in various ways: in some parts a covering of the one surrounds a mass of the other; in others they are alternated in laminæ or strata; and in others, they traverse each other in the form of cords; there is, however, a considerable uniformity in the disposition of each particular part. It has been said, that the gray matter in the cerebellum is in greater proportion than in the cerebrum; by others we are told that this seeming difference merely arises from the different manner in which it is in this part mixed with the white.

59. *Membranes of the brain.*—The dura mater, the pia mater, and the arachnoid membrane, are usually stated as membranes of the brain; others discard the first, and regard it merely as a membrane of the cranium. The pia mater is a vascular covering, made up entirely of blood-vessels for the supply of the brain. Dr. Gordon tells us that he cannot perceive the cellular tissue in it that Bichat has described; nor have any absorbents or nerves been discovered in it. It presents an appearance at some parts of very fine white dense threads, where it is loosely connected with the arachnoid membrane, but it is uncertain whether these are not blood-vessels.

60. The arachnoid membrane differs much from the pia mater in structure as well as in distribution. It is as thin as a cobweb, (hence its name,) dense, colourless, and almost perfectly transparent; it does not seem to be vascular, at least blood-vessels have never yet been detected in it, nor have absorbents or nerves.

61. *Relative proportions and progressive dimensions of the brain before and after birth.*—The Wenzels have paid particular attention to this; and they have reported, that both the brain proper and the cerebellum increase rather more in length and in breadth during the six months immediately preceding birth, than during the first

seven years after birth; that these dimensions arrive at their maximum at the age of seven; and that they suffer no change during the whole of after life. They have ascertained that the weight of the whole brain most commonly arrives at its maximum at the age of three years, and remains without diminution during the whole of after life; the maximum being in general from 20,000 to 22,000 grains, and seldom exceeding 24,000. The weight of the brain proper at the age of three years, they found does not exceed in general 21,000 grains; nor that of the cerebellum 2000 grains. The younger the fœtus, they found the greater was the ratio of the weight of the brain proper to that of the cerebellum. This ratio, it appeared, was usually about seven to one at the age of three years, and remained so ever after.

62. The spinal cord contains both kinds of nervous matter; but it has an additional membrane which has been called the serrated membrane, which is whitish and semi-transparent, thinner, but still stronger, than the pia mater. Its inner border, which is straight, is intimately connected with the pia mater; while its outer one presents a series of angular projections or teeth, each of which is attached firmly to the dura mater of the spinal canal. It does not reach the extremity of the cord which is membranous, but ends at the lower part of what has been considered the dorsal portion of the cord, the cord being divided into three parts; the first or cranial portion; the second or cervical; the the third or dorsal: of which see more in the second part of this article.

63. *The spinal cord before and after maturity.*—It has been said, that the nervous matter of the cord is proportionally shorter in the child than in the adult; others deny that this has been proved. Chaussier supposes this nervous matter is firmer at birth than at any other period of life. In the decline of life the brown nervous matter diminishes, and at length in old persons disappears, its place being occupied by white matter.

64. *Nerves.*—These are composed of filaments of nervous matter, enclosed in sheaths of a peculiar nature, called neurilema. These filaments are of different sizes in different nerves; they seldom, however, are thicker than a hair, and in general are smaller than the finest fibre of silk or cotton. They are placed side by side; and in their course divide and subdivide, and re-unite and run into each other, forming the most intimate connexions. The neurilema investing the fibres of the nerves, and tying them as it were in bundles or fasciculi, seems to be a species of cellular texture. Nerves have what are called plexuses and ganglia. The first are formed by the intervening of various nerves, so that each individual nerve is in a manner lost. The ganglia are constituted of knots or tumors of nervous substance of various shapes and sizes, some extending to nearly an inch. In these last the fasciculi of nervous filaments are first separated and then recombined; and it appears as if every fasciculus of every nerve which emerges from a ganglion, contained more or fewer filaments from every fasciculus of every nerve which entered it. On the structure, however, of ganglia much seems still obscure. The gray or yellowish matter that is found between the fasciculi of nerves going through ganglia, has been supposed by some to be similar to the gray portion of the brain and spinal cord. Others say that there is not the slightest similitude between them.

Textures of the Body.

65. *Muscle.*—This term is applied to a compound of delicate fibres, or solid diaphanous filaments, formed into bundles by a species of cellular substance; and which fibres being plentifully supplied with blood-vessels, nerves, and absorbents, have a red and highly vascular appearance. The diameter of the ultimate fibres has been considered so small as not to exceed the forty-thousandth part of an inch; these fibres are placed parallel to each other, and are united in the first place into fasciculi of a certain size, the largest not exceeding the eighth of an inch, and the smallest not being under a sixteenth. In point of length these fasciculi are various; but it has been affirmed by Prochaska, that he has traced them from one end of one of the longest muscles of the body to another. These fasciculi may be considered primary; they are usually found united together into longer fasciculi or secondary; these often into ternary, and so on.

66. *Tendon.*—This substance is constituted of very delicate white silvery-looking fibres collected into bundles, which are united with each other in various ways. Sometimes they are tied together longitudinally; at other times interwoven, almost with the same regularity as the threads in a piece of cloth; and at other times intermingled in every direction. This substance not only forms those appendages to muscles which are called tendons, but it expands itself into *ligaments*, stretches over bone, and is there called *periosteum*—over muscles forming the *aponeurosis* or tendinous *fascia;* and in other parts constitutes more positive membranes. Bichat indeed has named this texture système *Fibreux*; but an objection has very properly been taken against this denomination on the ground that other textures are as well as this fibrous.

67. *Bone.*—This is a uniform substance, of a firm texture, without fibre, plates, or cells, but penetrated throughout by very delicate vessels; it is capable of being rendered artificially softer or harder, without any abstraction or addition of its substance that is perceptible. It is externally lined by a membrane which is called periosteum generally, and pericranium in the bone of the skull.

68. *Cartilage.*—This substance, as well as bone, when viewed with a microscope appears uniform and homogenous in its structure like jelly, and without fibres, laminæ, or cells. No blood-vessels are seen in it in its finest form; but in those pieces of cartilage that are attached to the edges or extremities of growing bone, blood-vessels may be often seen ramifying, even without the aid of injection.

69. *Cellular substance.*—Improperly so named perhaps, since the cellular structure which it exhibits when distended, may probably be the mere effect of accidental separation of layers of

the substance, always accompanied with more or less laceration of parts. If we lay hold of a mass of it between the fingers, and pull it gently, it immediately separates itself into innumerable transparent laminæ, finer than the finest cobweb, which intersect each other in every direction, and leave space or cells between them of various shapes. The same effect may be produced with a blow-pipe; but the instant the distension is discontinued, the parts collapse, and the cellular appearance vanishes. Microscopic observation of this substance shows nothing but exceedingly delicate fibres interwoven in every direction.

70. *Adipose Substance.*—This texture is made up of an oily matter, and a vascular texture formed into cells, in which cells the oily matter is contained. This containing substance seems still more delicate in its texture, than what is called cellular substance. The oily matter that constitutes the fat, exists most probably in the living body in a fluid state.

71. *Membranes.*—This term might with some propriety be applied to parts of animal tissue generally; but it more strictly means expansions over surfaces internal or external, from which flows or is secreted a peculiar matter. Thus we have *mucous membrane*, *serous membrane*, and *synovial membrane;* to which is added, perhaps not in strict propriety, *fibrous membrane*.

72. *Mucous membrane*, says Bichat, presents two surfaces; the one adhering to the adjacent organs, the other free covered with villi: its structure displays in all parts the form of a membrane; it is never met with in fasciculi. Besides its vascular structure generally, it is furnished with glands of various size, which in general assume a spherical form. These glands do not seem to be enveloped by any membrane; they are supported by cellular tissue, and are soft and vascular.

73. *Serous membrane.*—This substance, like the mucous system, is also truly membranous, never, like the muscular organization, being seen in fasciculi. The serous membrane as well as the mucous has one of its surfaces free, the other attached. Bichat regards serous membrane as probably nothing else than an interlacement by means of cellular tissue of absorbents and exhalents, and considers that they are possessed of a small number of blood-vessels only, what are generally called their arteries being no other than trunks twining over their external surface, susceptible of being detached and not forming part of their structure. Dr. Gordon tells us, that the membrane itself is made up of arteries, veins, and absorbents. Whether he says it contains any thing else but vessels, remains to be ascertained.

74. *Synovial membrane.*—This like serous membrane is a thin transparent substance, with one surface free and the other attached; or, as it has been better expressed, having one surface turned towards certain cavities of the body, and another connected by delicate cellular substance to the sides of these cavities, or to the parts contained in them. Synovial membrane possesses in its healthy state but very little vascularity. Bichat says indeed, that its vessels, like those of the serous membranes, are rather exterior to its actual substance than part of it. It approaches more than the serous membrane to a fibrous structure.

75. *Fibrous membrane.*—Under the word tendon we have mentioned that Bichat proposes the introduction of fibrous tissue, système fibreux, as characterizing one order of membranes; and the objection of another anatomist is there stated to this designation, inasmuch as the term equally applies to nerve, muscle, and even cellular substance; and *ligaments*, *periosteum*, *aponeuroses*, *fasciæ*, &c. have an equal claim to the appellation. Indeed the ultimate structure of the body may be supposed a *fibre*, or the whole of the texture ultimately fibrous. The compound membranes consist of a mixture of two or more of the simple ones.

76. *Skin.*—This consists of two substances placed one above the other in the form of layers, or laminæ, the inner of which is called the *true skin*, the outer, *scarf skin* or *cuticle*, or *epidermis*. A light coloured membrane has been usually described under the name of *rete mucosum* between the cutis and cuticle, but Dr. Gordon tells us he has not, after the minutest examination, been able to discover this membrane in the inhabitants of this country, nor in those of other European nations, resembling them in colour; but he admits that there is in the Negro, Caffre and Malay, and he supposes in all black men, a black membrane, interposed between the epidermis and true skin, upon which the dark colour of these people seems to depend.

77. With respect to the structure of the skin, the cuticle is transparent and of a slightly yellowish-gray colour. It is entirely destitute of blood-vessels, absorbents, and nerves. It is not naturally laminated or fibrous. The true skin seems chiefly made up of a species of very small dense fibres closely interwoven with each other; its outer surface is more vascular than the internal parts; and this surface seems to owe its colour entirely to the blood circulating in its vessels. The absorbent vessels of the true skin are also large and numerous.

78. *Hair.*—All the hairs of the body appear to be cylindrical, and regularly taper from the root to the point. The bulbs of the hair are always situated under the true skin; but so close to its inner surface that no part of the hair is perceptible between it and the bulb. Immediately after leaving the bulb the hair is received into a canal in the true skin, which is constantly observed to be more or less oblique. A small hole in the cuticle corresponds to this canal; and the hair passing through it also reaches the outer surface of the skin. In its passage through the true skin it seems to adhere to the sides of the canal. The hairs appear to be quite solid: that part, however, of its root which is lodged in the bulb contains probably a conical cavity. In the whiskers of the seal this is certainly the case. The bulbs of the hair probably consist of two coats; an inner one of a tender consistence, very vascular, and embracing immediately the root of the hair; and the exterior one, firmer and less vascular.

79. *Nails.*—These are of a compact texture, and transparent like horn. Like the cuticle they are insensible and without vessels. They seem

to be formed by different layers of unequal size arranged one over the other, each layer being composed of longitudinal fibres. In each nail we may distinguish the root, the body, and the extremity; to the root, which is comparatively soft and thin, the scarf-skin firmly adheres.

80. *Parynchema.*—This name has been applied to that combination of membrane and vessel, which together forms the whole substance of viscera: thus we speak of the parynchema of the lungs, of the liver, &c. as distinct from their investing or lining membranes This parynchema is sometimes glandular or secretory, as in the instance of the liver; sometimes not, as in the case of the spleen. We may here take occasion to say that

81. *Glands* or *secreting organs* have been divided into *Follicular*, *Conglobate*, and *Conglomerate*. The first are said to be cylindrical tubes continued from the ends of arteries, and opening upon membranes external or internal. Of these, however, much has been stated from merely hypothetical notions. The second term has been applied to the glands of the lymphatic system above described (See 55). The third or conglomerate is a term applied to such glands as the salivary; the liver too and kidneys are conglomerate: these glands are unlike the lymphatic, inasmuch as they have distinct ducts for conveying away the peculiar and respective something which they secrete. These parts, indeed, constitute the essence of a gland; namely, a separating organization, and a duct or channel for conveying away the fluid or matter separated: now in the follicular glands it is supposed that one simple organization effects both purposes; while in the conglomerate gland one portion of the structure is employed in manufacturing, and the other in transmission.

82. Having thus presented the reader with a general view of the substances entering into the composition of the human body, we now proceed to particularize the organs which these substances variously modified go to the formation of; in other words, we now descend from the anatomy of composition to the anatomy of detail. In commencing, however, with the bones, it will be necessary in the first place to represent these in their totality. First then,

Of the Skeleton.

83. This has been properly defined the solid frame-work which supports and contains the softer parts. It is made up of 254 separate pieces of osseous substance, most of which contain a quantity of matter called marrow, and are surrounded with a membrane denominated periosteum. These separate pieces are called bones, which are connected in various ways. The bones are composed of a compact part, and, most of them, likewise of a reticulated portion, formed by fine plates intersecting each other and having small spaces between them. The marrow of bones is an oily substance, the properties of which have not yet been sufficiently investigated, and the periosteum is of a tendinous structure. This periosteum in general covers the whole outer surface of the bones, except at the place of their union.

84. The connections of bones are of two kinds, those that admit of motion, and those which do not. Where bones are united so as to allow of union, their touching surfaces are either provided with prolongation of cartilages, or they are united to one common intermediate substance, which is flexible and admits of compression. The surfaces of cartilage which enter into the composition of joints, are always as smooth as the finest polished ivory. It has been said by several anatomists, that those surfaces are covered by a very delicate prolongation of synovial membrane: this by others has been supposed not the case.

85. All articulated bones are held together partly by means of ligaments. These are formed of tendinous substance, and may be divided into fascicular and capsular. The first are disposed in cords, at intervals, around the joint; the second form a continuous web, including the united surfaces in a kind of sheet.

86. In all the intervals between fascicular ligaments, portions of synovial membrane are found filling up these intervals. They are attached to the ligaments on the one hand and to the articulated bones on the other, just at the edge of the cartilaginous surfaces. It is doubtful whether this membrane be continued over the inner surface of the fascicular ligaments, and how it is disposed in joints, of which the ligaments are of the capsular kind.

87. The bones which are united without articulation and with an intermediate substance, are principally the small bones of the spine, called vertebræ; the portions of these bones, denominated their bodies, are directly connected with pieces of a flexible and compressible substance, somewhat between cartilage and tendon in its nature, one piece being common to two vertebræ.

88. The connections that admit of motion are divided into two kinds, *suture* and *synchondrosis*. In the first the bones are united by direct contact, the contiguous parts being indented or serrated, and the projecting parts of the one being fixed into holes or grooves of the other; the periosteum merely passing over the line of junction. In the union by synchondrosis a piece of cartilage, or some similar substance, is interposed between the surfaces of the bones, which are joined together, and their connexion is further strengthened by ligaments; an example of this junction we have in the ossa innominata with the sacrum.

89. *Dimensions and weight of the skeleton.*—The skeleton of an individual who had been five feet eight inches will be found in general to be about five feet seven. The average weight of the skeleton, according to Soemmering, is from 150 to 200 ounces. The female skeleton, according to the same author, averages from 100 to 150 ounces.

90. *The skeleton before and after maturity.*—An embryo of seven or eight weeks distinctly shows parts that correspond with the adult skeleton. But at this period no bony substance is present. In the place of future bones we find either a pellucid substance like jelly, or else a simple membrane resembling the periosteum.

Some bones are wholly gelatinous, others wholly membranous, and others partly in the one and partly in the other state.

91. The process of ossification commences at about the end of the second month, but not in all parts of the skeleton. In some parts the process does not begin till after birth. For the mode in which ossification proceeds, refer to the article PHYSIOLOGY. Marrow does not appear in its proper form till after birth; indeed this fluid does not acquire the consistency of true medullary oil until the period of maturity. In old persons the membrane common to the marrow becomes less vascular, and the oil itself acquires a yellow colour. The periosteum is thicker, more tender, and more vascular in the fœtus than in the adult; in old persons the reverse is the case. As soon as the soft rudiments of the future bones are visible in the fœtus, divisions may be observed in them corresponding to the articulations and synchondrosis, but none to the sutures. The ligaments and synovial membranes in the young person differ only in size from those of the adult.

ANATOMY OF PARTICULAR PARTS OF THE SKELETON.

92. *Bones and sutures of the cranium.*—The bones of the cranium are eight; or, according to some, ten in number. The difference of enumeration depending upon whether the petrous portion of the temporal bones are regarded, or not, as distinct bones. The eight bones are, the *os frontis;* the *two parietal bones;* the *os occipitis;* the *ossa temporum;* the *os sphenoides;* and *os ethmoides.*

93. *Os Frontis.*—This forms the upper and fore part of the cranium. It is outwardly convex, its concave surface being towards the brain. Its lower parts compose the superior portions of the orbits of the eyes. In the centre of the inferior part of this bone is placed also the ethmoid bone, which is situated at the top of the cavity of the nostrils. On the exterior surface of the frontal bone there are five processes: one placed at the bottom and narrowest part is called the nasal. The four others are called angular or orbitar processes, which assist to form the orbits. In the middle of the bone, above the os ethmoides, most commonly a thin spine, by which this part of the bone is strengthened. This is not always present, but when it is absent the skull is thicker than usual at this part and from its middle externally a process issues which supports the bones of the nose. Immediately above the ethmoid bone, in this bone, is a small blind hole through which a vein passes into the longitudinal sinus of the dura mater; and, on the upper edge of each orbit, a small perforation or notch is found, through which nerves and an artery pass to the forehead. There is also a small foramen in each orbit, through which passes a branch of what are called the fifth pair of nerves. This bone is, almost throughout its whole substance, composed of two tables, which separating from each other under the eyes form two cavities, one on each side of the bone, called frontal sinuses. In these sinuses a mucus is secreted from their internal membrane, which constantly passes through two small holes into the nostrils, which it serves to moisten.

94. The parietal bones are two: in some places they are thin and almost transparent. They are of an irregular square figure, and are bordered with indentations through their whole circumference, except at the lower part. These bones form a kind of vault to the cranium. On their inner surface the marks of the vessels of the dura mater are observed, and at their upper edge is found the groove for the superior longitudinal sinus.

95. The *occipital bone* forms the back and inferior part of the skull; it has considerable indentations. At its inferior portion is a large foramen, through which the medulla oblongata passes into the spine, or into the brain, as some anatomists would express themselves. This bone is bounded by the temporal, sphenoidal, and parietal bones. In its inside is a conical spine impressed by the longitudinal and lateral sinuses; and on the outside, opposite to the middle of this spine in some bodies, is an apophysis; and from that down to the great foramen a small thin spine: in most skulls a foramen is found behind each apophysis; through these pass sinuses from the lateral sinus to the external cervical veins.

96. The *temporal bones* are two, or according to some anatomists four, the petrous portions being considered by these last as distinct bones. These bones have several processes and cavities; one anterior called the zygomatic; one posterior called the mastoid, or mamillary, from its resemblance to a nipple; and one inferior named the styloid, because it is shaped like a stiletto or dagger.

97. The *cavities of the temporal bones* are the meatus auditorius externus; 2. a large fossa, which serves for the articulation of the lower jaw; it is before the meatus, and under the zygomatic process; 3. the styloi-mastoid foramen, so named from its situation between the styloid and mastoid process; it is likewise called the aquedect of Fallopius, and affords a passage for the portio dura of the seventh pair of nerves; 4. below, and on the fore-part of the last foramen, we observe part of the jugular fossa, in which the beginning of the internal jugular vein is lodged. Anterior and superior to this is the orifice of a foramen through which passes the carotid artery; and at this part of the bone the opening of the Eustachian tube is to be seen, a canal passing from the ear into the pharyngal cavity.

98. The *petrous portion* of this bone is of a triangular figure which separates two fossæ; one superior and anterior, the other inferior and posterior; the latter of these composes part of the fossa in which the cerebellum is placed; and the former a portion of the last fossa for the bases of the brain. On the posterior side of the parspetrosa is observed the meatus auditorius externus, into which enters the double nerve of the seventh pair. On the under side of this process part of a hole appears, which is common to the temporal and occipital bones; through it the lateral sinus, the eighth pair and accessory nerves pass.

99. This hard portion of the temporal bones contains the bones of the ear. The temporal bones are joined to the ossa malarum, to the parietal bones, to the occipital bone, and to the sphenoid bone.

100. The *os ethmoides*, or *sieve-like bone*, is about two inches in circumference; it is situated in the anterior part of the basis of the skull. It is pierced by a number of foramina, through which the olfactory nerves pass. From its middle arises a large process named crista galli, and opposite to this a thin one, which in part divides the nose. The greater part of the laminæ spongiosæ in the nose belongs to this one.

101. The *os sphenoides* is of a very irregular shape; it is seated in the middle of the basis of the skull, and is bounded by the os frontis, ethmoides, vomer, occipitis maxillæ superioris, ossa parietalia, palati, malarum, and temporum. In its inside, next the brain, is a cavity named sella turcica, which is bounded by four processes called clinoid; under the two foremost of which pass the internal carotid arteries, and from their outsides are continued two thin long processes upon that part of the frontal bone which separates the anterior from the posterior lobes of the brain. Opposite to the cella turcica is a process which makes part of the exterior of the nose. On the outside of the skull, adjoining the upper jaw, are two processes of this bone on each side, named pterygoid, from which arises one on each side near the palate, which have no name. Over these pass the tendons of the pterygostaphalini externi muscles; and more towards the occiput, between these and the styloid processes of the temporal bones, arise two small rugged processes. Under the sella turcica a sinus or two is mostly found in adults, but in children consisting only of such a spongy substance as is seen in the ends of some of the bones. At the inside of the basis of the two anterior clinoid processes are two round holes, which are the first foramina of the skull; through these the optic nerves pass. Nearly under these, towards the sides of the skull, are two irregular slits, named foramina lacera, or the second foramina of the skull, through which pass nerves and blood-vessels into the orbits. Under these, towards the occiput, are two round foramina, making the third, and through which pass nerves to the face. About half an inch nearer the occiput are two more of an oval figure, which are the fourth foramina, and through which pass the largest branches of the fifth pair of nerves. Very little further are two very small ones, called the fifth, through which enter branches of the carotid artery to the dura mater. Between the sphenoid and the petrous portion of the temporal bone are found two large irregular foramina, in which large veins are sometimes seen; and from these, through part of the bone under the pterygoid processes, proceed the small apertures through which pass arteries to the back of the nose.

102. The *sutures of the cranium* are the following: 1. The coronal suture which joins the parietal bones to the frontal; it runs across the skull from one upper edge of the sphenoidal bone to the other. 2. the sagittal suture joining the parietal bones together; it issues from the central upper part of the frontal bone, and is continued over the head to the occipital bone. In children the frontal bone is divided into two by a continuation of this suture through the os frontis down to the nose; this is sometimes the case in the adult, when the frontal bone is of course divided like the parietal into two. 3. the squamous suture is formed by the upper part of the temporal and sphenoidal bones wrapping over the lower edge of the parietal bones. 5. The transverse suture runs through the bottoms of the orbits, and joins the lower edge of the frontal bone to the os sphenoides, maxillæ superioris, ossa nasi, unguis, plana, palati, and malarum.

Bones of the Face and Mouth.

103. The face is divided into the superior and inferior maxilla. The first, that is the upper jaw, is formed of thirteen bones exclusive of the teeth; these are the two superior maxillary, two nasal, two palatine, two malar, two inferior spongy, two lachrymal, and the vomer; these are united to the cranium and to one another by harmony. The inferior maxilla, or under-jaw, is formed of one bone.

104. The *superior maxillary* bone consists of two parts; is in fact two bones, although sometimes described as a single one. It has two processes, which join the os frontis and constitute part of the nose; and a third which joins to the cartilage of the septum nasi. Its upper and outer parts compose the lower portions of the orbits; its inferior sides all that part of the face and the cheeks, eyes and nose, to the mouth, and two-thirds of the roof of the mouth. A little below the orbits are two holes, and behind the incisores teeth one more, which divides into two as it opens into the nose on each side of the septum nasi. Between the posterior molares and the orbits are two great sinuses, called antra maxillæ superioris, which open into the upper part of the nose. In the lower edge of this jaw are the sockets or alveoli for the teeth. All the body of this bone is hollow, forming a large sinus, which is commonly named antrum highmorianum. This antrum appears in the separate bone to have a large aperture into the nostrils; but in recent subjects it is so covered at its back part by the palate-bone, in the middle by the inferior sponge-bone, and anterior by a strong membrane, that one, and sometimes two holes, scarcely so large as a crow-quill, are only left at the upper part, which after a short winding process open into the nostrils between the two spongy bones. At the bottom of this cavity we may often observe some protuberances in which the small points of the roots of the teeth are contained. The cavity and the sockets of the teeth are often divided by the interposition of only a very thin bony plate.

105. The *ossa malarum* form the anterior, inferior, and outer parts of the orbits. They have each a short process, which joins the processus jugales of the temporal bones, and form arches which have been named ossa jugalia. The whole of the malar bone is by some indeed called jugal.

106. The *ossa nasi* constitute the upper part of the nose, and form that arch which is called the bridge of the nose.

107. The *ossa unguis*, or lachrymalia, are situated immediately below the frontal bone towards the nose and within the orbits, the anterior and inner parts of which they help to compose. Between each of them and the upper jaw a foramen is found, as large as a goose-quill, for the passage of the lachrymal duct into the nose.

108. The *ossa palati* are small and of a very irregular figure; they form the back part of the roof of the mouth, and a small part of the bottom of each orbit. Between the palatine and maxillary bones, near the pterygoid process of the sphenoid, are two small foramina, through which arteries and nerves pass to the palate.

109. The *spongy bones* are situated in the sides and lower part of the nostrils; they are considered by some as merely the spongy laminæ of the ethmoid: and some anatomists further describe two planar bones which are also rather parts of their spongy surfaces than properly separate bones.

110. The *vomer*, so called from its supposed resemblance to the ancient plough-share, is placed between the bones of the palate and the sphenoidal bone. It divides the nostrils into two parts, forming with its cartilage the septum nasi.

111. The *inferior maxillary*, or lower jaw-bone, occupies the whole inferior and anterior part of the face. The shape of the bone is something like that of a horse-shoe. It is articulated with the temporal bones by the condyloid processes. Near these arise two others called coronal; and at the inside of the chin a small rough process called processus inominatus. In the inside of this bone, under each coronal process, is a large foramen which runs under the teeth and passes out near the chin. Through this the vessels pass which belong to the teeth; and in the upper edge of the jaw are the alveoli, or sockets for the teeth.

The Teeth.

112. These are hard bones, partly covered with a peculiar substance called enamel, and fixed in the upper and under jaw in such sort, that in the adult there are sixteen belonging to each.

113. Each tooth is divided into a crown, which is covered by the enamel; a nut, or the part embraced by the gum; and a root, or fang, which last is hidden within the socket.

114. The teeth are of four kinds; viz. incisores, cuspidati, bicuspides, and molares. The first are eight in number, four in each jaw; they are placed in the front of the mouth, are flat, and sharp-edged; the roots, or fangs, are simple: those of the upper jaw are fixed obliquely backwards, so that they generally cover a small part of the incisores of the under jaw. The cuspidati are four in number, one cuspidatus being placed on each side of the incisores. The fang of these teeth is single, and goes a considerable way under the jaw, especially the two of the upper jaw which have been called the eye-teeth, under the supposition that the fangs reached the eye. The end of these teeth is pointed, their bodies being rounded. The bicuspides are eight, as there are two on the side of each cuspidatus; they appear, at both extremities, as if formed by the junction of two incisores. The molares are twelve, three are situated at the extremities of each jaw. The fangs of these are varied; those of the under-jaw have two, and of the upper-jaw three. Their oral extremities are full of irregularities. The two last are called sapientiæ, from the lateness of their appearance.

115. The first set of teeth consists of twenty. For the rationale of dentition, and mode in which the first are displaced to make way for the second set, consult the article Physiology.

Os Hyoides.

116. This is a detached bone, placed at the root of the tongue, and has some resemblance to the Greek letter *υ*, whence its name. This bone is convex, and irregular at its fore part; and unequally concave at its interior surface. Its uses are to support the tongue, and give attachment to a considerable number of muscles; some of which are proper to the tongue, while others belong to the fauces and larynx. At birth this bone is principally cartilaginous.

Bones of the Trunk.

117. The trunk is formed of the spine, the thorax, and the pelvis; the first of which is made up of twenty-four bones called vertebræ; to which are added the sacral bone, and os coccygis. The vertebræ are divided into cervical, which are seven; into dorsal, which are twelve; and into lumbar, which are five in number. The first vertebra of the neck is called atlas. The bodies of these vertebræ are smaller, and of a firmer texture than the other vertebræ. From the middle of the posterior part of each vertebra, except the first, stands a process which is named spinal; and from every one there is a process on each side called transverse; while there are two upper and two under ones that are shorter, which are named the superior and inferior oblique processes. The fore part of the seven vertebræ of the neck, and two upper ones of the back, are anteriorly flat. The third and fourth of the back are acute. The spinal processes of the second, third, fourth, and fifth, of the cervical vertebræ are forked; the two last long and horizontal, as are the three or four upper ones of the back: these last, however, are a little declining. The middle ones of the dorsal run obliquely downwards, and the processes of the remaining vertebræ become successively thicker, stronger, and less declining, those of the loins being horizontal. The transverse processes of the cervical vertebræ are perforated for the admission of the cervical blood-vessels. The eight or nine superior ones of the back receive the upper ribs; and the rest, with those of the loins, serve only for the origin and insertion of muscles.

118. The *os sacrum* has two upper oblique processes, some small spinal processes, and two foramina in each interstice of the bones which compose it, both before and behind.

119. The *os coccygis* is formed of a chain of bones,

each piece becoming smaller as it descends; it is convex behind, and concave anteriorly; it is triangular in its form. At birth it is cartilaginous; and in old age the separate pieces of which it is made up become firmly united; and with the os sacrum become one continued mass of bone.

120. Through every bone of the spine, the os coccygis excepted, there is a large foramen, which, together, make up the long channel for the passage of the medulla-spinalis, and in each space between the vertebræ are two large foramina for the passage of the several nerves.

121. The bodies of the vertebræ are all connected by strong ligaments or intervening cartilages. In the cervical portion of the bony column, the oblique processes are wrapped over those of the receiving bone. It is the same with the dorsal vertebræ. The vertebræ of the loins are received into deep cavities, and are attached by strong ligaments.

122. The *ribs* are twelve in number on each side; the seven uppermost being generally called true ribs, their cartilages reaching the sternum; and the five lowest are called false. They are articulated to the twelve vertebræ of the back, and all, except the two or three last ones, are articulated to the transverse processes of the vertebræ. The substance of the ribs is cellular and spongy, with a thin lamellated surface, which, as it approaches the vertebræ, becomes thicker and stronger. To the fore end of each rib, a long, broad, and strong cartilage is fixed, and thence reaches to the sternum, or is joined to the cartilage of the next rib. These cartilages make a considerable curve, their concave part being upwards; in old persons they often become very much ossified.

123. The *sternum*, or breast-bone, is mostly composed of three spongy bones, sometimes of more. To this two of the cartilages of the ribs are attached. At the inferior extremity of the sternal bone, what is called the ensiform cartilage is attached. This is situated at the part which is called the pit of the stomach. The number of the vertebræ, and also of the ribs, is subject to slight variations.

124. The *pelvis*.—This is so named from its resemblance to a basin formerly used by barbers. It constitutes in a manner the base of the skeleton's trunk. Four bones enter into its composition: viz. two ossa inominata, the os sacrum, and the os coccygis. The ossa inominata are composed of three bones, which in young persons are separate: viz. the ilium, and the ischium, and the os pubis; the first being placed uppermost, the second the lowest, and the third anteriorly. In the centre of these bones is the acetabulum, or socket for receiving the round extremity, or head, as it is called, of the thigh-bone.

125. There is a considerable difference in the form and cavity of the male and female pelvis. In the latter the sacral bone is shorter and broader, and the iliac portions of the ossa inominata are more expanded; so that the brim of the pelvis, in females, is nearly of an oval shape, being considerably wider from side to side, than from the junction of the two ossa pubis to the sacrum; the ischia, too, are more separated from each other in the female pelvis, so that the lower part of the pelvis is likewise wider than in man, and the sacrum though shorter is more hollowed; while the os coccygis is more moveable, from being more loosely connected with the sacrum.

Bones of the Lower Extremities.

126. Each lower extremity is divided into three parts, the thigh, the leg, and the foot; to which the patella or knee-bone may be added.

127. *Os femoris*, or femur, is the single bone by which the thigh is formed. It is a long cylindrical bone, situated between the pelvis and the leg; its head, which as we have just said is received into the acetabulum, has a small depression in the middle for the attachment of the round or restraining ligament. The neck, which is between the body of the bone and its head, is rough and gives attachment to the capsular ligament. What is called the great trochanter of the femur is a large unequal eminence below its neck; and then there is another named the small trochanter. The body of the os femoris is smooth and convex before and hollow posteriorly, where there is a rough line called linea aspera.

128. The leg consists of three bones; the tibia, the fibula, and the patella.

129. The tibia is a long, thick, triangular and cylindrical bone placed between the femur and tarsus in the anterior and inside of the leg. It is thickest at its upper extremity. Its anterior ridge or angle is called the spine or shin; at the lower end of this bone a considerable process is found which forms the inner ancle.

130. The fibula is a longitudinal bone situated at the outer part of the leg by the side of the tibia. The process which is at the lower extremity of this bone forms the outer ancle. It is connected to the tibia by an interosseous ligament.

131. The patella rotula, or knee-pan, is a small triangular spongy bone, situated between the interior extremity of the thigh bone and upper part of the tibia. It is connected to the condyles of the femur and also to the tibia.

132. The foot bones are distinguished into three orders: viz. the tarsus, metatarsus, and toes. The tarsus consists of seven small bones placed between the leg and metatarsus; they are called astragalus, os calcis, os naviculare, os cuboides, and three ossa cuneiformia. The astragalus is the upper bone of the foot; it is large and articulated both with the tibia and the fibula supporting the tibia, and being supported itself by the os calcis. This last is of a very irregular figure, and is the largest bone of the foot. Behind it is formed into a considerable tuberosity called the heel. On the internal surface of the os calcis there is a considerable sinuosity which affords a passage to a tendon, and to its hind part a very strong tendinous chord is attached called the tendo Achilles. The navicular bone is concave at its posterior part so as to receive the astragalus; anteriorly it is connected with the cuneiformi bones, and laterally with the os cuboides, which last, as its name

supports, is of cube shape and is connected with the heel bone; it also supports the two last bones of the metatarsus, and joins the third cuneiform and the navicular bone.

133. Each of the cuneiform bones resembles a wedge. They are placed next to the metatarsus, are united to the navicular bone, and support the three first metatarsal bones. The whole of these bones in connection form the upper part of the foot, the mass being convex above and concave underneath.

134. The metatarsus is composed of five bones; the first of these, which is much larger than the rest, supports the great toe; the others are pretty nearly alike in size, and correspond with the other toes, the junction of them all being at one end with the cuneiform bones and os cuboides, and at the other with the toes. The bodies of these bones are somewhat triangular.

135. The toes consist of three bones, excepting the great toe which is made up of only two; the three bones are called phalanges.

136. There are several bones called sesamoid, occasionally found among the bones of the toes; they are usually situated on the joints of the great toe; their size is ordinarily about that of a small pea.

Bones of the Upper Extremities.

137. These hang from the superior parts of the sides of the chest and are composed of the bones of the shoulder, arms, fore-arm, and hand.

138. The shoulder is made up of two bones, viz. the clavicle or collar-bone, and scapula or shoulder-blade; these are united together immediately over the top of the os humeri, and thus form what is properly termed the shoulder.

139. The clavicle is a long roundish bone, shaped like the letter S, and situated obliquely in the upper and lateral part of the chest.

140. The scapula, or blade-bone, is triangular, and placed in the upper and lateral part of the back. Its anterior and internal surface is irregularly concave; its posterior and external surface is convex, and divided into two unequal parts by a ridge or process called the spine of the scapula; the fore part of this process is named the acromion, to which the clavicle is fixed. Near this process is another called coracoid, and close to this is a semicircular niche or groove for the passage of blood-vessels.

141. The shoulder joint is formed by the large round head of the humerus and the shallow articular cavity of the scapula.

142. The arm consists of one long bone, the humerus just mentioned which occupies the space between the junction of the clavicle with the scapula, and the fore-arm. It is a long cylindrical bone, thickish at its ends, and distinguished into body and extremities. The humerus is connected to three bones, with the scapula, the radius, and the ulna.

143. The fore-arm is made up of two bones, the ulna and radius; the first forms the internal and posterior, and the second the external and anterior part. The ulna, at its upper extremity, has one large process named olecranon, and a small process on the fore part; and on one side between these is also a small cavity which receives the upper end of the radius. At the lower end of the ulna is a process called styliform, and a round head which is received into the radius.

144. The radius is received at its upper end into the ulna. A little below its head a large tubercle is found. There is likewise a thin edge into which the transverse ligament is fixed, which arises from the ulna. The radius is connected to the humerus, the ulna, and the carpus.

145. The carpus, metacarpus, and fingers, compose the bones of the hand; as the tarsus, metatarsus, and toes, do those of the feet. Each hand has thus twenty-six bones.

146. The carpus or wrist is situated between the fore-arm and metacarpus. It is composed of eight bones, which lie close to one another in a double row, one of which is superior, the other inferior; in the superior row are the os naviculare or scaphoides, os lunare, os cuneiforme, and os orbiculare or pisiforme. In the lower row are the trapezium, trapezoides magnum, and cuneiform bones. All these bones are convex towards the back, and slightly concave towards the palm of the hand; they bear some resemblance to the names given to them, but are not easily known when seen separately.

147. The metacarpus consists of four bones, which sustain the fingers, and one shorter bone for the thumb.

148. The fingers are situated at the inferior extremity of the metacarpus, and consist of the thumb and four fingers, properly so called. These last consist of three separate parts, called phalanges; the thumb is only divided into two phalanges. Each phalanx of the fingers is broadest at its upper extremity, and formed into a superficial cavity; the body or middle part is convex outwardly and concave anteriorly. The lower extremity is rounded.

Of Ligaments, Cartilages, &c.

For the general structure and constitution of ligaments, see § 66 et seq.

149. *Ligaments of the head.*—The condyle of the under jaw has a capsular ligament, which is connected with the temporal bone. There is also a lateral ligament extending between the posterior maxillary foramen, and the petrous portion of the temporal bone. Within the joint there is an interarticular cartilage. A general capsular ligament surrounds the condyles and connects the skull with the cervical vertebræ. Between the occipital bone and upper part of the tooth-like process of the second cervical vertebra, there is a perpendicular ligament. There are two ligaments also which have been named lateral; these arise from each side of the tooth-like process, and are inserted into the occipital bone before the condyles. There is also a circular ligament arising from the edge of the spinal foramen, and inserted into the edge of the foramen magnum.

150. *Ligaments of the vertebræ.*—There are tendinous extensions between the spinous and transverse processes of the vertebræ; and a strong fibrous ligament runs along the fore parts of the vertebræ, which becomes broader as it approaches the sacral bone; it is formed by a number of intervertebral ligamentous fibres: between the spinous processes of the neck, an elastic yellow

ligament passes; and there is an internal transverse ligament of the atlas. All the bones of the vertebræ, and every joint that is without motion and not joined by a suture, are joined by *intervening* ligaments, or, as they are commonly called, *cartilages*.

151. *Ligaments of the ribs and sternum.*—Capsular ligaments unite the ribs to the vertebræ behind, and to the sternum before; and the cartilages of the ribs are united to each other by a perpendicular ligament. There are likewise internal and external ligaments of the necks of the ribs. The former arise from the superior margin of the neck of the ribs, and are fixed into the inferior surface of the transverse processes of the dorsal vertebræ immediately above; and the latter, which arise from the upper margin of the ribs, are inserted into the external margin of the inferior oblique process of the vertebræ above. The sternum is invested with a ligamentous sheath, and there are also ligaments arising from the cartilages of the seventh rib, and are fixed into the ensiform cartilage.

152. *Ligaments of the pelvis.*—The os coccygis is united to the sacral bone by a capsular ligament. The ossa innominata are tied by very strong ligaments which run from the back of the spines of the ossa ilia to the os sacrum, and other ligaments which go from the os sacrum, and os coccygis to the acute and obtuse processes of the ossa ischia. Towards the great foramen of the ossa innominata the acetabulum has a notch, across which runs a ligament that completes the socket. From the edge of the ilium to that of the os pubis, runs a ligament which is contiguous to, and seems to constitute a part of, the tendons of the muscles of the abdomen. The pubic bones are united by an intermediate cartilage somewhat like the intervertebral cartilage, and there is a capsular ligament of the symphysis pubis.

153. *Ligaments of the hip-joint.*—There is a capsular ligament to this joint, which encloses not only the head, but also the whole neck of the thigh bone; a ligament is also found within the joint nearly of a triangular shape; and a double cartilago-ligamentous membrane is stretched across the breach in the inner and anterior part of the acetabulum; the bony margin of the acetabulum is further encircled by a ligament which adds considerably to its depth, and which is called the cotyloid ligament. The cavity of the acetabulum is likewise lined by a synovial membrane, the edges of which are retained in their situation by small ligamentous fibres.

154. *Ligaments of the knee-joint.*—The knee-joint has a capsular ligament, and lateral ligaments which are reflections of the first; and, besides other smaller ligaments, there are two called crucial, which cross each other; and there are crescent-like cartilages entering into the composition of this joint; they surround the two cavities at the head of the tibia: the patella too is fixed in its place by the tendon of the exterior muscles, and by a strong ligament which is inserted into the anterior tuberosity of the tibia. The synovial membrane of the knee-joint covers the condyles of the thigh bone, lines the patella, and then passes to the tibia.

155. *Ligaments of the leg, tarsus, metatarsus, and toes.*—Between the tibia and fibula a strong interosseous ligament is extended, and the upper extremity of the latter bone is connected by a capsular ligament to the outer surface of the tibia; there are several ligaments also which unite the inferior extremity of the fibula and tibia. A capsular ligament is fixed to the margin of the articular cavity of the tibia and fibula, going over the astragalus; it is strengthened by a great many other ligamentous fibres. The astragalus is articulated by two cartilaginous planes to the os calcis, and there are lateral and inferior ligaments fixing together the tarsal bones. The bones of the metatarsus and tarsus are united by capsular ligaments, and also by other short ligaments called, from their situation, dorsal, plantar, and lateral; and, according to the direction of their fibres, straight, oblique, and transverse. There are also capsular and lateral ligaments to the phalanges of the toes; and the tendons, which pass from the flexor and exterior muscles of the leg to be inserted into these parts, are enclosed in vaginal ligaments.

156. *Ligaments of the clavicle and scapula.*—The clavicle is connected to the sternal bone by a capsular ligament, and within the joint there is an outer articular cartilage; a ligament likewise passes across the sternum connecting one clavicle to the other. The shoulder joint has a capsular ligament; and from the coracoid process of the scapula a ligament arises which passes up obliquely and divides into two parts, one fixed into the clavicle, and one into the first rib. There is also an anterior proper ligament of the scapula, which passes between the coracoid process and acromion; while another, called the posterior, is stretched across the semilunar notch of the bone. There is a synovial apparatus to the capsular ligament of the shoulder joint as in other joints of this description.

157. *Ligaments of the elbow-joint.*—The capsular ligament of this joint is much less extensive than that of the shoulder. On each side of it there are lateral ligaments; and there is an annular ligament including the neck of the radius, and which is fixed to the opposite sides of the semilunar cavity of the ulna. Some other ligamentous bands passing over the capsular ligament have been named accessory.

158. *Ligaments of the arm, carpus, metacarpus, and fingers.*—Between the radius and ulna there is a strong ligamentous membrane, as in the case of the leg; and a capsular ligament encloses the carpal extremity of the ulna, which arises from the edges of the semilunar cavity at this end of the bone. A capsular ligament is also found connecting the glenoid cavity of the radius with the scaphoides, lunare, and cuneiform bones: and between the upper and under rows of bones which compose the carpus there is also a capsular ligament; and there are lateral, oblique, transverse, and perpendicular ligaments, common to the carpus. The carpal bones joining the metacarpus are united to the latter by capsular ligaments; and ligamentous bands extend between the bases of the metacarpal bones; at the heads of these bones interosseous ligaments are also placed; and there are vaginal ligaments which enclose the tendons of the flexor muscles,

as also crucial ligaments binding down these tendons; while the tendons of the extensor muscles are united by transverse ligaments near to the heads of the metacarpal bones

Of the Particular Muscles.

159. In this division of our subject we pursue the plan of our predecessors, viz. that of presenting the several muscles in a tabular form, in order to avoid unnecessary circumlocution. It is proper, however, to premise that all the muscles of the body are not included in this view; those belonging to the eyes, the internal ear, and the intestinum rectum, are described in other parts of the present article.

TABLE OF THE MUSCLES.

160. Muscles situated under the Integuments of the Cranium.

Name.	*Origin.*	*Insertion.*	*Use.*
1. Occipito-frontalis.	From the transverse ridge of the os occipitis.	Into the skin of the eye-brows.	To pull the skin of the head backwards, and to raise the eye-brows and skin of the forehead.
2. Corrugator supercilii.	From above the joining of the os frontis, os nasi, and os maxillare.	Into the inner part of the occipito-frontalis.	To draw the eye-brows towards each other, and to wrinkle the forehead.

161. Muscles of the Eye-lids.

1. Orbicularis palpebrarum.	From around the edge of the orbit.	Into the nasal process of the os maxillare.	To shut the eye.
2. Levator palpebræ superioris.	From the bottom of the orbit, near the optic foramen.	Into the cartilage of the upper lid.	To open the eye.

162. Muscles of the External Ear.

1. Attollens auriculam.	From the tendon of the occipito-frontalis, near the os temporis.	Into the upper part of the ear.	To raise the ear.
2. Anterior auriculæ.	From near the back part of the zygoma.	Into an eminence behind the helix.	To raise this eminence and to pull it forwards.
3. Retrahentes (a) auriculæ.	From the outer and back part of the root of the mastoid process.	Into the convex part of the concha.	To stretch the concha, and pull the ear backwards.

163. Muscles of the Cartilages of the Ear.

1. Tragicus.	From the outer and middle part of the concha near the tragus.	Into the upper part of the tragus.	To depress the concha, and pull the point of the tragus a little outwards.
2. Anti-tragicus.	From the root of the inner part of the helix.	Into the upper part of the anti-tragus.	To dilate the mouth of the concha.
3. Transversus auriculæ.	From the upper part of the concha.	Into the inner part of the helix.	To stretch the concha and scapha, and likewise to pull the parts it is connected with towards each other.
4. Helicis major.	From the upper, anterior, and acute part of the helix.	Into the cartilage of the helix, a little above the tragus.	To depress the upper part of the helix.
5. Helicis minor.	From the lower and fore part of the helix.	Into the helix, near the fissure in its cartilage.	To contract the fissure.

164. Muscle of the Nose.

Compressor (b) naris.	From the upper part of the root of the ala nasi.	Into the nasal process of the os maxillare, and anterior extremity of the os nasi.	To straighten the nostrils, and likewise to corrugate the skin of the nose.

165. Muscles of the Mouth and Lips.

Name.	*Origin.*	*Insertion.*	*Use.*
1. Levator labii superioris, alæque nasi.	From the outer part of the orbitar process of the os maxillare, and from the nasal process of that bone, where it joins the os frontis.	Into the upper lip and ala of the nose.	To draw the upper lip and skin of the nose upwards and outwards.
2. Levator anguli oris.	From the os maxillare superius, between the orbitar foramen and the first dens molaris.	Into the orbicularis oris at the angle of the mouth.	To raise the corner of the mouth.
3. Zygomaticus major.	From the os malæ, near the zygomatic suture.	Into the angle of the mouth.	To raise the angle of the mouth, and make the cheek prominent, as in laughing.
4. Zygomaticus minor.	Immediately above the origin of the zygomaticus major.	Into the angle of the mouth.	To raise the angle of the mouth obliquely outwards.
5. Buccinator.	From the alveoli of the dentes molares in the upper and lower jaws.	Into the angle of the mouth.	To contract the mouth and draw the angle of it outwards and backwards.
6. Depressor labii superioris, alæque nasi.	From the os maxillare superius, immediately above the gums of the dentes incisores.	Into the root of the ala nasi and upper lip	To draw the ala nasi and upper lip downwards.
7. Depressor anguli oris.	At the side of the chin from the lower edge of the maxilla inferior.	Into the angle of the mouth	To draw the corner of the mouth downwards.
8. Depressor labii inferioris.	From the lower and anterior part of the maxilla inferior.	Into the upper lip.	To draw the under lip downwards and somewhat outwards.
9. Levator labii inferioris.	From near the gums of the incisores and caninus of the maxilla inferior.	Into the under lip and skin of the skin.	To raise the under lip and skin of the chin.
10. Orbicularis oris (c).			To shut the mouth by constringing the lips.

166. Muscles of the Lower Jaw.

1. Temporalis.	From part of the os bregmatis and os frontis; squamous part of the os temporis; back part of the os malæ, and the temporal process of the os sphenoides (d).	Into the coronoid process of the lower jaw.	To move the lower jaw upwards
2. Masseter (e).	From the malar process of the os maxillare, and the lower edges of the os malæ, and of the zygomatic process of the os temporis.	Into the basis of the coronoid process & that part of the jaw which supports that and the condyloid process.	To raise and likewise to move the jaw a little forwards and backwards.
3. Pterygoideus internus.	From the inner surface of the outer wing of the pterygoid process of the os sphenoides, and from the process of the os palati, that helps to form the pterygoid fossa.	Into the lower jaw on its inner side and near its angle.	To raise the lower jaw, and draw it a little to one side.
4. Pterygoideus externus.	From the external ala of the pterygoid process, a small part of the adjacent os maxillare, and a ridge in the temporal process of the os sphenoides.	Into the fore part of the condyloid process of the lower jaw, and likewise of the capsular ligament.	To move the jaw forwards and to the opposite side (f); and at the same time to prevent the ligament of the joint from being pinched.

167. Muscles situated at the Fore Part of the Neck.

1. Latissimus colli (g).	From the cellular membrane covering the pectoral, deltoid, and trapezius muscles.	Into the side of the chin and integuments of the cheek.	To draw the cheeks and skin of the face downwards; and, when the mouth is shut, to draw all that part of the skin to which it is connected below the lower jaw upwards.

Name.	*Origin.*	*Insertion.*	*Use.*
2. Mastoideus (H).	From the upper part of the sternum, and from the upper and fore part of the clavicle.	Into the mastoid process, and as far back as the lambdoidal suture.	To move the head to one side, or, when both muscles act, to bend it forwards.

168. Muscles situated between the Trunk and the Os Hyoides

1. Omo-hyoideus (I).	From the upper costa of the scapula near its niche; from part of a ligament that extends across this niche, and sometimes by a few fibres from the coracoid process.	Into the basis of the os hyoides.	To draw the os hyoides in an oblique direction downwards.
2. Sterno-hyoideus.	From the cartilage of the first rib, the inner and upper part of the sternum, and a small part of the clavicle.	Into the basis of the os hyoides.	To draw the os hyoides downwards.
3. Hyo-thyroideus.	From part of the basis and horn of the os hyoides.	Into a rough oblique line at the side of the thyroid cartilage.	To raise the thyroid cartilage, or depress the os hyoides.
4. Sterno-thyroideus.	From between the cartilages of the 1st and 2d ribs, at the upper and inner part of the sternum.	Immediately under the hyo-thyroideus.	To pull the thyroid cartilage downwards.
5. Crico-thyroideus.	From the anterior part and side of the cricoid cartilage.	Into the lower part and inferior horn of the thyroid cartilage.	To pull the cricoid cartilage upwards and backwards, or the thyroid forwards and downwards.

169. Muscles situated between the Os Hyoides and the Lower Jaw.

1. Diagastricus (K).	From a fossa at the root of the mastoid process, and likewise from the os hyoides.	Into the lower and anterior part of the chin.	To draw the lower jaw downwards.
2. Stylo-hyoideus (L).	From the basis of the styloid process.	Into the side and fore-part of the os hyoides near its base.	To draw the os hyoides obliquely upwards.
3. Mylo-hyoideus (M).	From the basis of the lower jaw, between the last dens molaris and the chin.	Into the basis of the os hyoides.	To move the os hyoides to either side, forwards or upwards.
4. (N.) Genio-hyoideus.	From the inside of the chin.	Into the base of the os hyoides.	To move the os hyoides forwards or upwards.
5. Genio-glossus.	From the inside of the chin.	Into the tongue and basis of the os hyoides.	To move the tongue in various directions.
6. Hyo-glossus (O).	From the horn, basis, and appendix of the os hyoides.	Into the tongue laterally.	To draw the tongue downwards and inwards.
7. Lingulis	Laterally from the root of the tongue.	Into the extremity of the tongue.	To shorten the tongue and draw it backwards.
8. Stylo-glossus.	From the styloid process, and sometimes also from a ligament that extends from thence to the angle of the lower jaw.	Into the side of the tongue from the root to near its tip.	To move the tongue backwards and to one side.
9. Stylo-pharyngæus.	From the basis of the styloid process.	Into the side of the pharynx and posterior part of the thyroid cartilage.	To raise the thyroid cartilage and pharynx, and likewise to dilate the latter.
10. Circumflexus-palati.	From near the bony part of the Eustachian tubes and from the spinous process of the os sphenoides	Into the semilunar edge of the os palati, and the velum pendulum palati (P).	To dilate and draw the velum obliquely downwards.
11. Levator palati.	From the membranous part of the Eustachian tube, and the extremity of the os petrosum.	Into the velum pendulum palati.	To pull the velum backwards.

170. Muscles situated about the Fauces.

Name.	*Origin.*	*Insertion.*	*Use.*
1. Palato-pharyngæus.	From the lower and anterior part of the cartilaginous extremity of the Eustachian tube (Q); the tendinous expansion of the circumflexus palati; and the velum pendulum palati near the basis and back part of the uvula.	Into the upper and posterior part of the thyroid cartilage.	To raise the pharynx and thyroid cartilage, or to pull the velum and uvula backwards and downwards.
2. Constrictor isthmi faucium.	From near the basis of the tongue laterally.	Into the velum pendulum palati, near the basis and forepart of the uvula.	To raise the tongue and draw the velum towards it (R).
3. Azygos uvulæ.	From the end of the suture that unites the ossa palati.	Into the extremity of the uvula.	To shorten the uvula, and bring it forwards and upwards.

171. Muscles situated at the Back Part of the Pharynx.

1. Constrictor pharyngis superior.	From the cuneiform process of the occipital bone; the pterygoid process of the os sphenoides, and from each jaw near the last dens molaris (S).	Into the middle of the pharynx.	To move the pharynx upwards and forwards, and to compress its upper part.
2. Constrictor pharyngis medius (T).	From the horn and appendix of the os hyoides, and from the ligament that unites it with the thyroid cartilage.	Into the middle of the processus cuneiformis of the occipital bone, about its middle and before the great foramen.	To draw the os hyoides and pharynx upwards, and to compress the latter
3. Constrictor pharyngis inferior (U).	From the cricoid and thyroid cartilage.	Into the middle of the pharynx.	To compress part of the pharynx.

172. Muscles about the Glottis.

1. Crico-arytænoideus lateralis.	From the side of the cricoid cartilage.	Into the basis of the arytænoid cartilage laterally.	To open the glottis.
2. Crico-arytænoides posticus.	From the cricoid cartilage posteriorly.	Into the basis of the arytænoid cartilage posteriorly.	To open the glottis.
3. Arytænoideus obliquus.	From the basis of one of the arytænoid cartilages.	Near the extremity of the other arytænoid cartilage.	To draw the parts it is connected with towards each other
4. Arytænoideus transversus.	From one of the arytænoid cartilages laterally.	Into the other arytænoid cartilage laterally.	To shut the glottis.
5. Thyreo-arytænoideus.	From the posterior and under part of the thyroid cartilage.	Into the arytænoid cartilage.	To draw the arytænoid cartilage forwards.
6. Arytæno-epiglottideus.	From the upper part of the arytænoid cartilage laterally.	Into the side of the epiglottis.	To move the epiglottis outwards.
7. Thyreo-epiglottideus.	From the thyroid cartilage.	Into the side of the epiglottis.	To pull the epiglottis obliquely downwards (W.)

173. Muscles at the Fore Part of the Neck, close to the Vertebræ.

1. Rectus capitis internus major.	From the anterior extremities of the transverse processes of the five lowermost cervical vertebræ.	Into the fore part of the cuneiform process of the os occipitis.	To bend the head forwards.
2. Rectus capitis internus minor.	From the anterior and upper part of the first cervical vertebræ.	Near the basis of the condyloid process of the occipitis.	To assist the last described muscle.
3. Rectus capitis lateralis.	From the anterior and upper part of the transverse process of the first cervical vertebra.	Into the os occipitis, opposite to the stylo-mastoid foramen.	To move the head to one side

Name.	*Origin.*	*Insertion.*	*Use.*
4. Longus colli.	Within the thorax, laterally from the bodies of the three uppermost dorsal vertebræ; from the basis and fore part of the transverse processes of the first and second dorsal vertebræ, and of the last cervical vertebra; and lastly from the anterior extremities of the transverse processes of the 6th, 5th, 4th, and 3rd cervical vertebræ.	Into the second cervical vertebra anteriorly.	To pull the neck to one side (x).
	174. Muscles at the Fore Part of the Abdomen.		
1. Obliquus externus	From the lower edges of the eight inferior ribs, near their cartilages.	Into the linea alba (y), ossa pubis (z), and spine of the ilium (a).	To compress and support the viscera, assist in evacuating the fæces and urine, draw down the ribs, and bend the trunk forwards, or obliquely to one side.
2. Obliquus internus.	From the spinous process of the three lowermost lumbar vertebræ, the back part of the os sacrum, the spine of the ilium, and back part of Fallopius's ligament (c).	Into the cartilages of all the false ribs, linea alba (b), and fore part of the pubis.	To assist the obliquus externus.
3. Transversalis.	From the cartilages of the seven inferior ribs; the transverse processes of the last dorsal, and four upper lumbar vertebræ; the inner part of Fallopius's ligament, and the spine of the ilium.	Into the linea alba and cartilago ensiformis.	To compress the abdominal viscera.
4. Rectus abdominis.	From the upper end of the pubis and the symphysis pubis.	Into the cartilages of the 5th, 6th, and 7th ribs, and the edge of the cartilago ensiformis (d).	To compress the fore part of the abdomen, and to bend the trunk forwards.
5. Pyramidalis (e).	From the anterior and upper part of the pubis.	Into the linea alba and inner edge of the rectus, commonly about two inches above the pubis.	To assist the lower portion of the rectus
	175. Muscles at the Fore Part of the Thorax.		
1. Pectoralis major.	From the cartilaginous ends of the 5th and 6th ribs; the sternum and anterior part of the clavicle.	Into the upper and inner part of the os humeri (f).	To draw the arm forwards, or obliquely forwards.
2. Subclavius.	From the cartilage of the first rib.	Into the under surface of the clavicle.	To move the clavicle forwards and downwards, and to assist in raising the first rib.
3. Pectoralis minor (g).	From the upper edges of the 3d, 4th, and 5th ribs.	Into the coracoid process of the scapula.	To move the scapula forwards and downwards, or to elevate the ribs.
4. Serratus magnus.	From the eight superior ribs.	Into the basis of the scapula.	To bring the scapula forwards.
	176. Muscles that concur in forming the Thorax.		
1. Diaphragma (h).			
2. Levatores costarum.	From the transverse processes of the last cervical, and the eleven upper dorsal vertebræ.	Into the upper side of each rib near its tuberosity.	To move the ribs upwards and outwards.

Name.	*Origin*	*Insertion.*	*Use.*
3. Intercostales externi.	From the lower edge of each upper rib.	Into the superior edge of each lower rib.	To elevate the ribs.
4. Intercostale interni (i).			
5. Sterno castales (k).	From the cartilago ensiformis, and the lower and middle part of the sternum.	Into the cartilages of the 2d, 3d, 4th, 5th, and 6th ribs.	To depress the cartilages of the ribs.

177. MUSCLES AT THE BACK PART OF THE NECK AND TRUNK.

1. Trapezius (l), or cucullaris.	From the middle of the os occipitis, and the spinous processes of the two inferior cervical, and of all the dorsal vertebræ (m).	Into the posterior half of the clavicle part of the ancromion, and the spine of the scapula.	To move the scapula
2. Rhomboideus (n).	From the spinous processes of the three lowermost cervical and of all the dorsal vertebræ.	Into the basis of the scapula.	To move the scapula upwards and backwards.
3. Latissimus dorsi.	From part of the spine of the os ilium, the spinous processes of the os sacrum and lumbar vertebræ, and of six or eight of the dorsal vertebræ: also from the four inferior false ribs near their cartilages.	Into the os humeri, at the inner edge of the groove for lodging the long head of the biceps muscle.	To draw the os humeri downwards and backwards, and to roll it upon its axis.
4. Serratus inferior posticus.	From the spinous processes of the two lowermost dorsal, and of three of the lumbar vertebræ.	Into the lower edges of the three or four lowermost ribs near their cartilages.	To draw the ribs outwards, downwards, and backwards.
5. Levator scapulæ.	From the transverse processes of the four uppermost vertebræ colli.	Into the upper angle of the scapula.	To move the scapula forwards and upwards.
6. Serratus superior posticus.	From the lower part of the ligamentum colli, the spinous process of the lowermost cervical vertebra, and of the two superior dorsal vertebræ.	Into the second, third, and fourth ribs.	To expand the thorax.
7. Splenius (o).	From the spinous processes of the four or five uppermost vertebræ of the back, and of the lowermost cervical vertebra.	Into the transverse processes of the two first cervical vertebræ, the upper and back part of the mastoid process, and a ridge on the os occipitis.	To move the head backwards
8. Complexus (p).	From the transverse processes of the four or five uppermost dorsal, and of the six lowermost cervical vertebræ.	Into the os occipitis.	To draw the head backwards.
9. Trachelo mastoideus (q).	From the transverse processes of the first dorsal vertebræ, and four or five of the lowermost cervical vertebra.	Into the mastoid process.	To draw the head backwards.
10. Rectus capitis posticus major.	From the spinous process of the second cervical vertebra.	Into the os occipitis.	To extend the head and draw it backwards.
11. Rectus capitis posticus minor.	From the first vertebra of the neck.	Into the os occipitis.	To assist the rectus major.
12. Obliquus superior capitis.	From the transverse process of the first cervical vertebra.	Into the os occipitis.	To draw the head backwards.
13. Obliquus inferior capitis.	From the spinous process of the second cervical vertebra.	Into the transverse process of the first cervical vertebra.	To draw the face towards the shoulder and to move the first vertebra upon the second.
14. Sacro-lumbalis (r).	From the back part of the os sacrum, spine of the ilium, spinous processes, and roots of the transverse processes of the vertebræ of the loins.	Into the lower edge of each rib.	To draw the ribs downwards, move the body upon its axis assist in erecting the trunk, and turn the neck backwards, or to one side.

Name.	*Origin.*	*Insertion.*	*Use.*
15. Longissimus dorsi (s).	The same as that of the sacro-lumbalis.	Into the transverse processes of the dorsal vertebræ.	To stretch the vertebræ of the back, and keep the trunk erect.
16. Spinalis dorsi.	From the spinous processes of the uppermost lumbar and lowermost dorsal vertebræ.	Into the spinous processes of the nine superior dorsal vertebræ.	To extend the vertebræ.
17. Semi-spinalis dorsi.	From the transverse processes of the 7th, 8th, 9th, and 10th vertebræ of the back.	Into the spinous processes of the four uppermost dorsal, & lowermost of the cervical vertebræ.	To extend the spine obliquely backwards.
18. Multifidus spinæ (t).	From the os sacrum, ilium, oblique and transverse processes of the lumbar vertebræ, transverse processes of the dorsal, and four of the cervical vertebræ.	Into the spinous processes of the lumbar, dorsal, and six of the cervical vertebræ.	To extend the back, and draw it backwards or to one side
19. Semi-spinalis colli.	From the transverse processes of the five or six uppermost dorsal vertebræ.	Into the spinous processes of the 2d, 3d, 4th, 5th, and 6th cervical vertebræ.	To stretch the neck obliquely backwards
20. Scalenus (u).	From the transverse processes of the five inferior cervical vertebræ.	Into the upper and outer part of the first ribs.	To move the neck forwards, or to one side.
21. Inter spinales (x).	From the upper part of each of the spinous processes of the six inferior cervical vertebræ.	Into the under part of each of the spinous processes of the vertebræ above.	To draw the spinous processes towards each other
22. Inter-transversales (y).	From the upper part of each of the transverse processes of the vertebræ.	Into the under part of each of the transverse processes of the vertebræ above.	To draw the transverse processes towards each other.

178. Muscles within the Cavity of the Abdomen, on the anterior and lateral Parts of the Spine.

1. Psoas parvus (z).	From the sides of the transverse processes of the uppermost lumbar vertebra, and sometimes of the lowermost dorsal vertebra.	Into the brim of the pelvis, at the junction of the os pubis with the ilium.	To bend the loins forwards.
2. Psoas magnus.	From the bodies and transverse processes of the last dorsal and all the lumbar vertebræ.	Into the os femoris, a little below the trochanter minor.	To bend the thigh forwards.
3. Iliacus internus.	From the inner lip, hollow part, and edge of the os ilium.	In common with the psoas magnus.	To assist the psoas magnus.
4. Quadratus lumborum (*a*).	From the posterior part of the spine of the illium.	Into the transverse processes of the four uppermost lumbar vertebræ, the inferior edge of the last rib, and the side of the lowermost dorsal vertebra.	To support the spine, or to draw it to one side.
5. Coccygæus.	From the posterior aud inner edge of the spine of the ischium.	Into the lower part of the os sacrum, and almost the whole length of the os coccygis laterally.	To draw the os coccygis forwards and inwards (*b*).

179. Muscles on the Scapula and upper Part of the os humeri.

1. Deltoides (*c*).	From the clavicle, processus acromion, and spine of the scapula.	Into the anterior and middle part of the os humeri.	To raise the arm
2. Supra spinatus.	From the basis, spine, and upper costa of the scapula.	Into a large tuberosity at the head of the os humeri.	To raise the arm.

Name.	*Origin.*	*Insertion.*	*Use.*
3. Infra spinatus.	From the basis and spine of the scapula.	Into the upper and middle part of the tuberosity.	To roll the os humeri outwards.
4. Teres minor. (*d*).	From the inferior costa of the scapula.	Into the lower part of the tuberosity.	To assist the infra spinatus.
5. Teres major.	From the inferior angle, and inferior costæ of the scapula.	Into the ridge at the inside of the groove formed for the long head of the biceps.	To assist in the rotatory motion of the arm.
6. Subscapularis.	From the basis, superior and inferior costa of the scapula.	Into the upper part of a small tuberosity at the head of the os humeri.	To roll the arm inwards.
7. Coraco-brachialis (*e*).	From the coracoid process of the scapula.	Into the middle and inner side of the os humeri.	To roll the arm forwards and upwards.

180. Muscles on the Os Humeri.

1. Biceps flexor cubiti.	By two heads, one from the coracoid process, and the other, or long head, from the upper and outer edge of the glenoid cavity of the scapula.	Into the tuberosity at the end of the radius.	To bend the fore arm
2. Brachialis internus.	From the os humeri, below, and at each side of the tendon of the deltoids.	Into a small tuberosity at the fore part of the coronoid process of the ulna.	To assist in bending the fore-arm
3. Triceps extensor cubiti.	By three heads: the first from the inferior costa of the scapula; the second from the upper and outer part of the os humeri; and the third from the back part of that bone.	Into the upper and outer part of the olecranon.	To extend the forearm.

181. Muscles on the Fore Arm.

1. Supinator longus.	From the outer ridge and anterior surface of the os humeri, a little above its outer condyle.	Into the radius near its styloid process.	To assist in turning the palm of the hand upwards.
2. Extensor carpi radialis longus.	Immediately below the origin of the supinator longus.	Into the upper part of the metacarpal bone of the middle finger.	To extend the wrist.
3. Extensor carpi radialis brevis.	From the outer and lower part of the outer condyle of the os humeri, and the upper part of the radius.	Into the upper part of the metacarpal bone of the middle finger.	To assist the extensor longus.
4. Extensor digitorum communis.	From the outer condyle of the os humeri.	Into the back part of all the bones of the four fingers.	To extend the fingers.
5. Extensor minimi digiti.	From the outer condyle of the os humeri.	Into the bones of the little finger.	To extend the little finger.
6. Extensor carpi ulnaris.	From the outer condyle of the os humeri.	Into the metacarpal bone of the little finger.	To assist in extending the wrist.
7. Anconæus (*f*).	From the outer condyle of the os humeri.	Into the outer edge of the ulna.	To extend the forearm.
8. Flexor carpi ulnaris.	From the inner condyle of the os humeri, and anterior edge of the olecranon (*g*).	Into the os pisiforme.	To assist in bending the hand.
9. Palmaris longus.	From the inner condyle of the os humeri.	Into the internal annular ligament, and aponeurosis palmaris (*h*).	To bend the hand.
10. Flexor carpi radialis.	From the inner condyle of the os humeri.	Into the metacarpal bone of the fore finger.	To bend the hand.

Name.	*Origin.*	*Insertion.*	*Use.*
11. Pronator radii teres.	From the outer condyle of the os humeri, and coronoid process of the ulna.	Into the anterior and convex edge of the radius near its middle.	To roll the hand inwards.
12. Flexor sublimis perforatus (*i*).	From the inner condyle of the os humeri, inner edge of the coronoid process of the ulna, and upper and anterior part of the radius.	Into the second bone of each finger.	To bend the second joint of the fingers.
13. Supinator radii brevis.	From the outer condyle of the os humeri, and posterior surface & outer edge of the ulna.	Into the anterior, inner and upper part of the radius.	To roll the radius outwards.
14. Abductor pollicis longus.	From the middle and back part of the ulna, interosseus ligament, and radius.	By two tendons into the os trapezium, and first bone of the thumb.	To stretch the first bone of the thumb outwards.
15. Extensor minor pollicis.	From the back part of the ulna, and interosseus ligament, and radius.	Into the convex part of the second bone of the thumb.	To extend the second bone of the thumb obliquely outwards.
16. Extensor major pollicis.	From the back of the ulna and interosseus ligament.	Into the third and last bone of the thumb.	To stretch the thumb obliquely backwards.
17. Indicator.	From the middle of the ulna.	Into the metacarpal bone of the fore finger.	To extend the forefinger.
18. Flexor profundus perforans.	From the upper and fore part of the ulna and interosseus ligament.	Into the fore part of the last bone of each of the fingers.	To bend the last joint of the fingers.
19. Flexor longus pollicis.	From the upper and fore part of the radius.	Into the last joint of the thumb	To bend the last joint of the thumb.
20. Pronator radii quadratus.	From the inner and lower part part of the ulna.	Into the radius opposite to its origin.	To roll the radius inwards and of course to assist in the pronation of the hand.

182. Muscles on the Hand.

1. Lumbricales. (*k*).	From the tendons of the perforans.	Into the tendons of the extensor digitorum communis.	To bend the first, and to extend the two last joints of the fingers (*l*).
2. Abductor brevis pollicis.	From the fore part of the internal annular ligament, os scaphoides, and one of the tendons of the abductor longus pollicis.	Into the outer side of the second bone of the thumb near its root.	To move the thumb from the fingers.
3. Opponens pollicis.	From the inner and anterior part of the internal annular ligament & from the os scaphoides	Into the first bone of the thumb.	To move the thumb inwards and to turn it upon its axis.
4. Flexor brevis pollicis.	From the os trapezoides, internal annular ligament, os magnum, and os unciforme.	Into the ossa sesamoidea & second bone of the thumb.	To bend the second joint of the thumb.
5. Abductor pollicis.	From the metacarpal bone of the middle finger.	Into the basis of the second bone of the thumb.	To move the thumb towards the fingers.
6. Abductor indicis.	From the inner side of the first bone of the thumb, and from the os trapezium.	Into the first bone of the fore finger posteriorly.	To move the fore finger towards the thumb.
7. Palmaris brevis	From the internal annular ligament, and aponeurosis palmaris.	Into the os pisiforme, and the skin covering the abductor minimi digiti	To contract the palm of the hand.
8. Abductor minimi digiti.	From the internal annular ligament and os pisiforme.	Into the side of the first bone of the little finger.	To draw the little finger from the rest.
9. Flexor parvus minimi digiti.	From the os unciforme and internal annular ligament.	Into the first bone of the little finger.	To bend the little finger.
10. Abductor metacarpi minimi digiti.	From the os unciforme and internal annular ligament.	Into the metacarpal bone of the little finger.	To move that bone towards the rest.

Name.	*Origin.*	*Insertian.*	*Use.*
11. Interossei interni.	Situated between the metacarpal bones.	Into the roots of the fingers.	To extend the fingers and move them towards the thumb (*m*.)
12. Interossei externi.	From between the metacarpal bones on the back of the hand.	Into the roots of the fingers.	To extend the fingers; but the first draws the middle finger inwards, the second draws it outwards, the third draws the ring finger inwards.

183. MUSCLES AT THE BACK PART OF THE PELVIS, AND UPPER PART OF THE THIGH.

1. Glutæus (*n*) maximus	From the spine of the ilium, posterior sacroischiatic ligaments, os sacrum, and os coccygis.	Into the upper part of the *linea aspera* of the os femoris.	To extend the thigh and draw it outwards.
2. Glutæus medius.	From the spine and superior surface of the ilium.	Into the outer and back part of the great trochanter of the os femoris.	To draw the thigh outwards and a little backwards, and when it is bended, to roll it.
3. Glutæus minimus.	From the outer surface of the ilium, and the border of its great niche.	Into the upper and anterior part of the great trochanter.	To assist the former.
4. Pyriformis (*o*).	From the anterior part of the os sacrum.	Into a cavity at the root of the trochanter major.	To roll the thigh outwards.
5. Gemini (*p*).	By two portions, one from the outer surface of the spine of the ischium, the other from the tubcrosity of the ischium and posterior sacro-ischiatic ligament.	Into the same cavity as the pyriformis.	To roll the thigh outwards, and likewise to confine the tendon of the obturator internis, when the latter is in action
6. Obturator internus.	From the superior half of the inner border of the foramen thyroideum.	Into the same cavity with the former.	To roll the thigh outwards.
7. Quadratus (*q*) femoris.	From the tuberosity of the ischium.	Into a ridge between the trochanter major and trochanter minor.	To move the thigh outwards

184. MUSCLES OF THE THIGH (*r*).

1. Biceps flexor.	By two heads, one for the tuberosity of the ischium, the other from the linea aspera near the insertion of the glutæus maximus.	Into the upper and back part of the fibula (*s*).	To bend the leg.
2. Semi-tendinosus.	From the tuberosity of the ischium.	Into the upper and inner part of the tibia.	To bend and draw the leg inwards.
3. Semi-membranosus	From the tuberosity of the ischium.	Into the upper and back part of the head of the tibia.	To bend the leg.
4. Tensor vaginæ femoris	From the superior and anterior spinous process of the ilium.	Into the inner side of the fascia lata which covers the outside of the thigh.	To stretch the fascia.
5. Sartorius.	From the superior and anterior spinous process of the ilium.	Into the upper and inner part of the tibia.	To bend the leg inwards (*u*).
6. Rectus.	By two tendons; one from the anterior and inferior spinous process of the ilium, the other from the posterior edge of the cotyloid cavity.	Into the upper and fore part of the rotula,	To extend the leg.
7. Gracilis	From the fore part of the ischium and pubis.	Into the upper and inner part of the tibia.	To bend the leg.
8. Vastus externus (*x*).	From the anterior and lower part of the great trochanter, and the outer edge of the linea aspera.	To the upper and outer part of the rotula.	To extend the leg.

Name.	*Origin.*	*Insertion.*	*Use.*
9 Vastus internus.	From the inner edge of the linea aspera, beginning between the fore part of the os femoris and the root of the lesser trochanter.	Into the upper and inner part of the rotula.	To extend the leg.
10. Cruræus (*y*).	From the outer and anterior part of the lesser trochanter.	Into the upper part of the rotula.	To extend the leg.
11. Pectinalis.	From the anterior edge of the os pubis, or pectinis, as it is sometimes called	Into the upper and fore part of the linea aspera.	To draw the thigh inwards, upwards, and to roll it a little outwards.
12. Adductor longus femoris (*z*).	From the upper and fore part of the os pubis.	Near the middle and back of the linea aspera.	To draw the thigh inwards, upwards, and to roll it a little outwards.
13. Adductor brevis femoris.	From the fore part of the ramus of the os pubis.	Into the inner and upper part of the linea aspera.	
14. Adductor magnus femoris.	From the lower and fore part of the ramus of the os pubis.	Into the whole length of the linea aspera.	
15. Obturator externus.	From part of the obturator ligament, and the inner half of the circumference of the foramen thyroideum.	Into the os femoris, near the root of the great trochanter.	To move the thigh outwards in an oblique direction, and likewise to bend and draw it inwards.

185. Muscles of the Leg

1. Gastrocnemius (*aa*) externus.	By two heads; one from the inner condyle, the other from the outer condyle of the os femoris.	By a great round tendon, common to this and the following muscle.	To extend the foot.
2. Gastrocnemius (*bb*) internus.	By two heads; one from the back part of the head of the fibula, the other from the upper and back part of the tibia.	By a large tendon (the *tendo Achillis*) common to this and the former muscle, into the lower and back part of the os calcis.	To extend the foot.
3. Plantaris (*cc*).	From the upper and posterior part of the outer condyle of the os femoris.	Into the inside of the back part of the os calcis.	To assist in extending the foot.
4. Popliteus (*dd*).	From the outer condyle of the thigh.	Into the upper and inner part of the tibia.	To assist in bending the leg, and rolling it inwards.
5. Flexor longus digitorum pedis.	From the upper and inner part of the tibia.	By 4 tendons, which, afterpassingthrough the perforations in those of the flexor digitorum brevis, are inserted into the last bone of all the toes, except the great toe.	To bend the last joint of the toe.
6. Flexor longus pollicis pedis.	From the back part, and a little below the head of the fibula.	Into the last bone of the great toe.	To bend the great toe.
7. Tibialis posticus.	From the back part and outer edge of the tibia, and likewise from the interosseous ligament and adjacent part of the fibula.	Into the inner and upper part of the os naviculare, and side of the os cuneiforme medium.	To move the foot inwards
8. Peroneus longus.	From the outer side of the head of the tibia, and also from the upper, anterior, and outer part of the *perone* or fibula, to which it adheres for a considerable way down.	Into the metatarsal bone of the great toe.	To move the foot outwards.
9. Peroneus brevis.	From the outer and fore part of the fibula.	Into the metatarsal bone of the little toe.	To assist the last described muscle.

Name.	*Origin.*	*Insertion.*	*Use.*
10. Extensor longus digitorum pedis.	From the upper, outer, and fore part of the tibia, interosseous ligament, and inner edge of the fibula.	By four tendons into the first joint of the smaller toes.	To extend the toes.
11. Peroneus tertius.	From the fore part of the lower half of the fibula, and from the interosseous ligament.	Into the metatarsal bone of the little toe.	To bend the foot.
12. Tibialis anticus.	From the upper and fore part of the tibia.	Into the os cuneiforme internum.	To bend the foot.
13. Extensor proprius pollicis pedis.	From the upper and fore part of the tibia.	Into the convex surface of the bones of the great toe.	To extend the great toe.

186. MUSCLES ON THE FOOT.

1. Extensor brevis digitorum pedis.	From the upper and anterior part of the os calcis.	By 4 tendons, one of which joins the tendon of the externus longus pollicis, and the other three the tendons of the extensor digitorum longus.	To extend the toes.
2. Flexor brevis digitorum pedis.	From the lower part of the os calcis.	By 4 tendons, which, after affording a passage to those of the flexor longus, are inserted into the second phalanx of each of the small toes.	To bend the second joint of the toes.
3. Abductor pollicis pedis.	From the inner and lower part of the os calcis.	Into the first joint of the great toe.	To move the great toe from the other toes.
4. Abductor minimi digiti.	From the outer tubercle of the os calcis, the root of the metatarsal bone of the little toe, and also from the aponeurosis plantaris.	Into the outer side of the first joint of the little toe.	To draw the little toe outwards.
5. Lumbricales pedis.	From the tendons of the flexor longus digitorum pedis.	Into the tendinous expansion at tne upper part of the toes.	To draw the toes inwards.
6. Flexor brevis pollicis pedis.	From the inferior and anterior part of the os calcis, and also from the inferior part of the os cuneiforme externum.	By two tendons into the first joint of the great toe.	To bend the first joint of the great toe.
7. Adductor pollicis pedis.	From near the roots of the metatarsal bones of the 2d, 3d, and 4th, toes.	Into the outer os sesamoideum, or first joint of the great toe	To draw the great toe nearer to the rest, and also to bend it.
8. Transversales pedis.	From the outer and under part of the anterior end of the metatarsal bone of the little toe.	Into the inner os sesamoideum, and anterior end of the metatarsal bone of the great toe.	To contract the foot.
9. Flexor brevis minimi digiti pedis.	From the basis of the metatarsal bone of the little toe.	Into the first joint of the little toe.	To bend the little toe.
10. Interossei pedis interni (*ff*).	Situated between the metatarsal bones.		
Interossei pedis externi (*gg*).			

187. NOTES REFERRED TO IN THE FOREGOING TABLE

(A) These are three small slender muscles. The inferior one is sometimes wanting.

(B) The nose is affected by the fibres of the occipito-frontalis, and by several muscles of the face; but this pair, the compressores, is the only one that is proper to it.

(C) This muscle is in a great measure, if not wholly, formed by the buccinator, zygomatici, depressores, and other muscles that move the lips. Its fibres surround the mouth like a ring.

(D) Some of its fibres likewise have their origin from a strong fascia that covers the muscle, and adheres to the bone round the whole circumference of its origin. When we remove this covering we find the muscle of a semicircular shape, with its radiated fibres converging and forming a strong middle tendon.

(E) So called from its use in chewing, its derivation being *μασισαομαι*, *manduco*, to eat.

(F) This happens when the muscle acts singly. When both act the jaw is brought horizontally forwards.

(G) This broad and thin muscular expansion, which is situated immediately under the common integuments, is by Winslow named *musculus cutaneus*. Galen gave it the name of *πλατυσμα μυωδες (Platysma myoides)*; the etymology of which is from *πλατυσμος*, *dilatatio*, *ηυς*, *musculus*, and *ειδος forma*.

(H) This, on account of its two origins, is by Albinus described as two distinct muscles, which he names *sterno-mastoideus* and *cleido-mastoideus*.

(I) As this muscle does not always arise from the caracoid process it seems to have been improperly named *caraco-hyoides* by Douglas and Albinus. Winslow calls it *omo-hyoideus* on account of its general origin from the scapula.

(K) From *δις* and *γαστηρ (biventur)*, because it has two fleshy bellies with a middle tendon. This tendon passes through the stylo-hyoideus.

(L) In some subjects we meet with another muscle, which, from its having nearly the same origin, insertion, and use as this, has been named *stylo-hyoideus alter*.

(M) So named from its arising near the dentes morales (*μυλοι*), and its being inserted into the os hyoides.

(N) From *γενειος mentum*, the chin.

(O) From *κερας*, *cornu*, and *γλωσσα*, *lingua*, the tongue.

(P) This muscle in its course forms a round tendon, which, after passing over a kind of hook formed by the inner plate of the pterygoid process of the sphenoid bone, expands into a tendinous membrane.

(Q) The few fibres that arise from the Eustachian tube are described as a distinct muscle by Albinus, under the name of *salpingo-pharyngæus*. They serve to dilate the mouth of the tube.

(R.) This muscle and the palato-pharyngæus likewise serve to close the passage into the fauces, and to carry the food into the pharynx.

(S) The three orders of fibres here mentioned, with a few others derived from the tongue, have given occasion to Douglas to describe them as four distinct muscles under the names of *cephalo-pharyngæus*, *mylo-pharyngæus*, *plery-pharyngæus*, and *glossy-pharyngæus*.

(T) Douglas makes two muscles of this, the *hyo-pharyngæus*, and *syndesmo-pharyngæus*.

(U) The crico-pharyngæus and thyro-pharyngæus of Douglas.

(W) When either this or the preceding muscle acts with its fellow the epiglottis is drawn directly downwards upon the glottis.

(X) When both muscles act the neck is drawn directly forwards.

(Y) The linea alba is that tendinous expansion which reaches from the cartilago ensiformis to the os pubis. It is formed by the interlacement of the tendinous fibres of the oblique and transverse muscles, and on this account some anatomists have considered these as three digastric muscles.

(Z) A little above the pubis the tendinous fibres of this muscle separate from each other, so as to form an opening called the ring of the obliquus externus, and commonly though improperly the ring of the abdominal muscles, there being no such aperture either in the transversalis or obliquus internus. This ring in the male subject affords a passage to the spermatic vessels, and in the female to the round ligament of the uterus.

(a) From the anterior and upper spinous process of the ilium, this muscle is stretched tendinous to the os pubis, and thus forms what is called by some *Fallopius's*, and by others *Poupart's ligament*. The blood-vessels pass under it to the thigh.

(b) The tendon formed by the upper part of this muscle, in its way to the linea alba, is divided into two layers. The posterior layer runs under, and the anterior one over, the rectus muscle.

(c) From this part it detaches some fibres, which extend downwards upon the spermatic chord, and form what is described as the cremaster muscle.

(d) The fibres of the rectus are generally divided by three tendinous intersections. The two upper thirds of this muscle passing between the tendinous layers of the obliquus internus, are enclosed as it were in a sheath; but at its lower part we find it immediately contiguous to the peritonæum, the inferior portion of the tendon

of the transversalis passing over the rectus, and adhering to the anterior layer of the obliquus internus.

(e) This muscle is sometimes wanting.

(f) The fibres of this muscle pass towards the axilla in a folding manner, and with those of the latissimus dorsi form the arm-pit.

(g) This and some other muscles derive their name of *serratus*, from their arising by a number of tendinous or fleshy digitations, resembling the teeth of a saw (*serra*).

(h) For a description of the diaphragm, see Sect. 281.

(i) The origin, insertion, and use of the internal intercostals, are similar to those of the external. The reader, however, will be pleased to observe, that the intercostales externi occupy the spaces between the ribs only from the spine to their cartilages; there being from thence to the sternum only a thin membrane, which is spread over the intercostales interni; and that the latter, on the contrary, extend only from the sternum to the angles of each rib.

The fibres of the external muscles run obliquely forwards; those of the internal obliquely backwards. This difference in the direction of their fibres induced Galen to suppose that they were intended for different uses; that the external intercostals, for instance, serve to elevate, and the internal ones to depress the ribs. Fallopius seems to have been the first who ventured to dispute the truth of this doctrine, which has since been revived by Boyle, and more lately still by Hamberger, whose theoretical arguments on this subject have been clearly refuted by the experiments of Haller.

(k) These consist of four, and sometimes of five, distinct muscles on each side. Vesalius, and after him Douglas and Albinus, consider them as forming a single muscle, which, on account of its shape, they name *triangularis*. Verheyen, Winslow, and Haller, more properly describe them as so many separate muscles, which, on account of their origin and insertion, they name *sterno-costales*.

(l) So named by Riolanus, from τραπεζα, on account of its quadrilateral shape. Columbus and others give it the name of *cucullaris*, from its resemblance to a monk's hood.

(m) The tendinous fibres of this muscle, united with those of its fellow in the nape of the neck, form what is called the *ligamentum colli*.

(n) This muscle consists of two distinct portions, which are described as separate muscles by Albinus, under the names of *rhomboideus minor* and *rhomboideus major*.

(o) According to some writers, this muscle has gotten its name from its resemblance to the spleen; others derive it from *splenium splint*.

(p) So named on account of its complicated structure.

(q) So named from its origin from the neck (τραχηλος) and its insertion into the mastoid process.

(r) Several thin fasciculi of fleshy fibres arise from the lower ribs, and terminate in the inner side of this muscle. Steno names them *musculi ad sacro-lumbalem accessorii*. The sacro lumbalis likewise sends off a fleshy slip from its upper part, which by Douglas and Albinus is described as a distinct muscle, under the name of *cervicalis descendens*. Morgagni has very properly considered it as a part of the sacro-lumbalis.

(s) At the upper part of this muscle a broad thin layer of fleshy fibres is found crossing, and intimately adhering to it. This portion, which is described by Albinus under the name of *transversalis cervicis*, may very properly be considered as an appendage to the longissimus dorsi. It arises from the transverse processes of the five or six dorsal vertebræ, and is inserted into the transverse processes of the six inferior cervical vertebræ. By means of this appendage the longissimus dorsi may serve to move the neck to one side, or obliquely backwards.

(t) Anatomists in general have unnecessarily multiplied the muscles of the spine. Albinus has the merit of having introduced greater simplicity into this part of myology. Under the name of *multifides spinæ*, he has very properly included those portions of muscular flesh intermixed with tendinous fibres, situated close to the back part of the spine, and which are described by Douglas under the names of *transversus colli, dorsi, and lumborum*.

(u) The ancients gave it this name from its resemblance to an irregular triangle (σκαληνος). It consists of three fleshy portions. The anterior one affords a passage to the axillary artery, and between this and the middle portion we find the nerves going to the upper extremities. The middle is in part covered by the posterior portion, which is the longest and thinnest of the three.

(x) In the generality of anatomical books we find these muscles divided into *inter-spinales cervicis, dorsi*, and *lumborum*, but we do not find any such muscles either in the loins or back.

(y) These muscles are to be found only in the neck and loins; what have been described as the *inter-transversales dorsi* being rather small tendons than muscles.

(z) This and the following pair of muscles derive their name of *psoas* from ψοα, *lumbus*, on account of their situation at the anterior part of the loins.

(a) So called from its shape, which is that of an irregular square.

(b) Some of the fibres of this muscle are united with those of the levator ani, so that it assists inclosing the lower part of the pelvis.

(c) So named from its supposed resemblance to the Greek Δ reversed.

(d) This and the following pair are called *teres*, from their being of a long and round shape.

(e) This muscle affords a passage to the musculo-cutaneous nerve.

(f) So called from αγκων, *cubitus*.

(*g*) Between the two origins of this muscle we find the ulnar nerve going to the fore-arm.

(*h*) The aponeurosis palmaris is a tendinous membrane that extends over the palm of the hand. Some anatomists have supposed it to be a production of the tendon of this muscle, but without sufficient grounds; for in some subjects we find the palmaris longus inserted wholly into the annular ligament, so as to be perfectly distinct from this aponeurosis; and it now and then happens that no palmaris longus is to be found, whereas this expansion is never deficient.

(*i*) This muscle is named *perforatus*, on account of the four tendons in which it terminates, being perforated by those of another muscle, the perforans.

(*k*) So named from their being shaped somewhat like the lumbricus or earth-worm.

(*l*) Fallopius was the first who remarked the two opposite uses of this muscle. Their extending power is owing to their connexion with the extensor communis.

(*m*) The third interosseus internus (for there are four of the externi and three of the interni) differs from the rest in drawing the middle finger from the thumb.

(*n*) From γλυτος, *nates*.

(*o*) So named from its pear-like shape.

(*p*) The two portions of this muscle having been described as two distinct muscles by some anatomists, have occasioned it to be named *gemini*. The tendon of the obturator internus runs between these two portions.

(*q*) That this muscle is not of the square shape its name seems to indicate.

(*r*) The muscles of the leg and thigh are covered by a broad tendinous membrane called *fascia lata* that surrounds them in the manner of a sheath. It is sent off from the tendons of the glutæi and other muscles, and, dipping down between the muscles it covers, adheres to the linea aspera, and spreading over the joint of the knee gradually disappears on the leg. It is thickest on the inside of the thigh.

(*s*) The tendon of this muscle forms the *outer ham-string*.

(*t*) So named on account of its origin, which is by a broad flat tendon three inches long.

(*u*) Spigelius was the first who gave this the name of *sartorius*, or the tailor's muscle, from its use in crossing the legs.

(*x*) The vastus externus, vastus internus, and cruræus, are so intimately connected with each other, that some anatomists have been induced to consider them as a *triceps*, or single muscle with three heads.

(*y*) Under the cruræus we sometimes meet with two small muscles, to which albinus has given the name *subcruræi* They terminate on each side of the rotula, and prevent the capsular ligament from being pinched. When they are wanting, which is very often the case, some of the fibres of the curræus are found adhering to the capsula.

(*z*) This and the two following muscles have been usually, but improperly, considered as forming a single muscle with three heads, and on that account named *triceps femoris*.

(*aa*) Γαστροκνημια, *sura*, the calf of the leg.

(*bb*) This muscle is by some anatomists named *soleus*, on account of its being shaped like the sole fish.

(*cc*) This muscle has gotten the name of *plantaris*, from its being supposed to furnish the aponeurosis that covers the sole of the foot; but it does not in the least contribute to the formation of that tendinous expansion.

(*dd*) So called on account of its situation at the ham (*poples*).

(*ee*) This muscle, about the middle of the foot unites with a fleshy mass, which, from its having first been described by Sylvius, is usually called *massa cornea* JACOBI SYLVII.

(*ff*) The interossei interni are three in number; their use is to draw the smaller toes towards the great toe.

(*gg*) The interossei externi are four in number; the first serves to move the fore toe towards the great toe; the rest move the toes outwards. All the interossei assist in extending the toes

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We now proceed to place before the reader Dr. Barclay's proposal for change in the nomenclature and arrangement of muscles; but it is necessary first to state the mode in which he describes the base of the body.

TABULAR OUTLINE OF BARCLAY'S NOMENCLATURE.

I. GENERAL TERMS.

USED AS ADJECTIVES.		USED AS ADVERBS.	
New Terms.	*Old Terms.*	*New Terms.*	*Old Terms.*
Mesial.	*Internal.*	Mesiad.	*Inwards, within.*
Lateral.	*External.*	Laterad.	*Outwards, without.*
Dextral.	*Right.*	Dextrad.	*Towards the right.*
Sinistral.	*Left.*	Sinistrad.	*Towards the left.*
Peripheral.	*External, Superficial.*	Peripherad.	*Outwards; towards the surface*
Central.	*Internal, Deep-seated.*	Centrad.	*Inwards, within.*

II. TERMS PROPER TO THE HEAD

Coronal.	*Superior* in Man. *Anterior* in Quadrupeds.	Coronad.	*Upwards, above* in Man. *Forwards, before* in Quadrup.
Basilar.	*Inferior* in Man. *Posterior* in Quadrupeds.	Basilad.	*Downwards, below* in Man. *Backwards, behind* in Quadrup
Glabellar.	*Anterior* in Man. *Superior* in most Quadrup.	Glabellad.	*Forwards, before* in Man. *Upwards, above* in most Quad.
Inial.	*Posterior* in Man and most Quadrupeds.	Iniad.	*Backwards, behind.*
Antinial.	*Anterior & inferior* in Man. *Anterior* in most Quadrup.	Antiniad.	*Forwards & downwards* in Man. *Forwards* in most Quadrup.

III. TERMS PROPER TO THE NECK AND TRUNK

Atlantal.	*Superior* in Man. *Anterior* in Quadrupeds.	Atlantad.	*Upwards, above* in Man. *Forwards, before* in Quadrup.
Sacral.	*Inferior* in Man. *Posterior* in Quadrupeds.	Sacrad.	*Downwards, below* in Man. *Backwards, behind* in Quad.
Sternal.	*Anterior* in Man. *Inferior* in Quadrupeds.	Sternad.	*Forwards, before* in Man. *Downwards, below* in Quadrup.
Dorsal.	*Posterior* in Man. *Superior* in Quadrupeds.	Dorsad.	*Backwards, behind* in Man. *Upwards, above* in Quadrup.

IV. TERMS COMMON TO BOTH KINDS OF EXTREMITIES.

Proximal.	*Superior* in most cases.	Proximad.	*Upwards, above* in most cases.
Distal.	*Inferior* in most cases.	Distad.	*Downwards, below* in most cases.

V. TERMS PROPER TO THE ATLANTAL OR SUPERIOR EXTREMITIES.

Radial.	*Anterior* or *external*, according as the palm of the hand is turned towards the thigh or directed forwards.	Radiad.	*Forwards* or *outwards; before* or *without*, according to the direction of the palm.
Ulnar.	*Posterior* or *internal*, as above.	Ulnad.	*Backwards* or *inwards; behind* or *within*, as above.
Anconal.	*External* or *posterior*, as above.	Anconad.	*Outwards* or *backwards; without* or *behind*, as above.
Thenal.	*Internal* or *anterior*, as above.	Thenad.	*Inwards* or *forwards; within* or *before*, as above.

VI. TERMS PROPER TO THE SACRAL OR INFERIOR EXTREMITIES.

Tibial.	*Internal.*	Tibiad.	*Inwards, within.*
Fibular.	*External.*	Fibulad.	*Outwards, without*
Rotular.	*Anterior.*	Rotulad.	*Forwards, before.*
Popliteal.	*Posterior.*	Poplitead.	*Backwards, behind*

VII. TERMS PROPER TO THE SANGUIFEROUS SYSTEM

USED AS ADJECTIVES.				USED AS ADVERBS.	
New Terms.		*Old Terms.*		*New Terms.*	*Old Terms.*
Pulmonic.	Veins.	*Venæ Cavæ.*			
	Sinus.	*Right* or *Anterior.*	*Sinus.*	Pulmonad.	*Towards the lungs*
	Auricle.		*Auricle.*		
	Ventricle.		*Ventricle.*		
	Arteries.	*Pulmonary Artery and its branches*			
Systemic.	Veins.	*Pulmonary Veins.*			
	Sinus.	*Left* or *Posterior.*	*Sinus.*	Systemad.	*Towards the general system.*
	Auricle.		*Auricle.*		
	Ventricle.		*Ventricle*		
	Arteries.	*Aorta and its branches.*			

TABLE OF THE MUSCLES OF THE HUMAN BODY,

ARRANGED ACCORDING TO THE BONES TO WHICH THEY ARE ATTACHED.

ORIGINS.	I. OS FRONTIS.	INSERTIONS.
Ossa Occipitis, Temporum et alarum.	*Epicranius.*	Skin, orbiculares palpebrarum, corrugatores superciliorum, levatores labii superioris alarumque nasi.
	Orbicularis palpebrarum.	Skin, epicranius and corrugator supercil.
	Corrugatores Supercil.	Epicranius.
Ossa sphenoides, temporum et malarum.	*Temporales.*	Basilar maxilla.
	II. OSSA PARIETALIA.	
Ossa frontis, sphenoides, temporum et malarum.	*Temporales.*	Basilar maxilla.
	III. OSSA TEMPORUM.	
Sternum and clavicles.	Sternomastoidei.	
Transverse processes of the neck.	Trachelomastoidei.	
Spinal processes of the neck.	Splenii capitis.	
Ossa occipitis et frontis.	*Epicranius.*	Skin, orbic. palpeb. corrugat. supercil. levator. lab. super. alarumq. nasi.
	Orbicularis palpeorarum.	Skin, epicran. corrugat. supercil. levator. lab. super. alarumq. nasi.
Ossa frontis et sphenoides. Parietalia et malarum.	*Temporales.*	Basilar maxilla.
Ossa malarum.	*Masseteres.*	Basilar maxilla.
	Biventres maxillæ.	Basilar maxilla and os hyoides.
	Stylohyoidei.	Os hyoides.
	Styloglossi.	Tongue.
	Stylopharyngei.	Pharynx.
	Levatores palati mollis.	Soft palate.
	Laxatores tympanorum.	Mallei.
	Tensores tympanorum.	Ditto.
	Stapedii.	Stapedes.
	Anteriores auricularum.	Auricles.
	Retrahentes auricularum.	Ditto.
	IV. MALLEI.	
Ossa temporum. Eustachian tubes. Os sphenoides.	Laxatores tympanorum. Tensores tympanorum. Externi malleorum.	
	V. STAPEDES.	
Ossa temporum.	Stapedii.	

Origins.	*Muscles.*	*Insertions.*
	VI. OS OCCIPITIS.	
Spinous processes of the neck and back.	Trapezii.	Scapulæ Clavicles.
Spinous processes of the neck.	Splenii capitis.	
Transverse processes of the neck and back.	Complexi.	
Spinous process of second cervical verteb.	Recti capitis postici majores.	
Spinous process of atlas.	Recti cap. post. min.	
Transverse processes of the neck.	Recti cap. intern. min.	
Atlas.	Recti cap. intern. maj.	
Transverse processes of atlas.	Recti cap. lateral.	
Spinous process of atlas.	Obliqui. cap. super.	
Ossa frontis et temporum.	*Epicranius.*	Skin, orbic. palpeb. corrugat. supercil.
	Constrictores pharyngis.	Os hyoides pharynx.
	VII. OS SPHENOIDES.	
Ossa temporum, parietalia, malarum, frontis.	Temporales.	Basilar maxilla.
Corona maxilla.	*Pterygoidei externi.*	Ditto.
Ossa palati.	*Pterygoidei interni.*	Ditto.
	Pterygo-pharyngei.	Pharynx.
	Circumflexi palati.	Soft palate and uvula.
	Externi malleorum	Mallei.
	Levatores palpeb. super.	Coronal eyelids.
	Obliqui super. ocul.	Eyes.
	Recti attollentes ocul.	Ditto.
	Recti abductores ocul.	Ditto.
	Recti adductores ocul.	Ditto.
	Recti depressores ocul.	Ditto.
	VIII. OSSA MALARUM.	
Os frontis, parietalia, sphenoides.	*Temporales.*	Basilar maxilla.
Ossa temporum.	*Masseteres.*	Ditto.
	Zygomatici majores.	Orbicularis oris.
	Zygomatici minores.	Ditto.
	IX. CORONAL MAXILLA.	
	Compressores narium.	Skin.
	Levatores lab. sub. alarumq. nasi.	Alæ nasi and orbicular oris.
	Levatores angulorum oris.	Orbicular oris.
	Depressores alarum nasi.	Alæ nasi and upper lip.
Basilar maxilla.	*Buccinatores.*	Orbicular oris.
	Mylopharyngei.	Pharynx.
Os sphenoides.	*Pterygoidei externi.*	Basilar maxilla.
	Obliqui inferior. ocul.	Eyes.
	X. OSSA PALATI.	
Os sphenoides.	*Pterygoidei interni.*	Basilar maxilla
	Azygus uvulæ.	Uvula.
	XI. BASILAR MAXILLA.	
Ossa parietalia, temporum, malarum, frontis, sphenoides.	Temporales.	
Ossa temporum, malarum.	Masseteres.	
Os sphenoides and coronal maxilla.	Pterygoidei externi.	
Ossa sphenoides et palati.	Pterygoidei interni.	
Cellular texture between the skin and the deltoid and pectoral muscles.	Latissimi colli.	Depressores angulorum oris, &c.
Ossa temporum.	Biventres maxillæ	
	Mylohyoidei.	Os hyoides.
	Geniohyoidei.	Ditto.
Os hyoides.	*Geniohyoglossi.*	Tongue.

Origins.	*Muscles.*	*Insertions.*
Coronal maxilla.	*Buccinatores.*	Orbicularis oris.
	Depressores angulorum oris.	Ditto.
	Depressores labii inferioris.	Ditto.
	Levatores menti.	Fat and skin of the lower lip.
	Mylopharyngei.	Pharynx.
	XII. OS HYOIDES.	
Ossa temporum.	Biventres maxillæ.	Basilar maxilla.
Basilar maxilla.	Mylohyoidei.	
Ossa temporum.	Stylohyoidei.	
Basilar maxilla.	Geniohyoidei.	
Thyroid cartilage.	Thyrohyoidei.	
Sternum.	Sternohyoidei.	
Scapulæ.	Omo-hyoidei.	
Os occipitis.	Hyopharyngei.	
	Hyoglossi.	Tongue.
Basilar maxilla.	*Geniohyoglossi.*	Ditto.
	XIII. VERTEBRAL COLUMN.	
	1. CERVICAL VERTEBRÆ.	
Dorsal vertebræ. Transverse processes of the neck.	Longi colli.	
Atlas	Recti capitis interni minores.	Os occipitis.
	a. SPINOUS PROCESSES.	
Spinous processes of the neck.	Interspinales colli.	
Transverse processes of the neck and back.	Multifidi spinæ.	
Ditto.	Semispinales colli.	
Transverse processes of the back.	Semispinales dorsi.	Spinous processes of the back.
Spinous processes of the back.	*Trapezii.*	Os occipitis, scapulæ, clavicles.
	Splenii capitis.	Ossa temporum.
Spinous process of second cervical vertebra.	*Recti capitis postici majores.*	Os occipitis.
Spinous process of atlas	*Recti capitis postici minores.*	Ditto.
Spinous process of 2nd cervical vertebra.	*Obliqui capitis inferiores.*	Transverse processes of atlas.
Spinous processes of the back.	*Serrati postici superiores*	Ribs.
	Rhomboidei minores.	Bases of scapulæ.
	b. TRANSVERSE PROCESSES.	
Transverse processes of the neck.	Intertransversarii colli.	
Spinous processes of the back.	Splenii colli.	
Transverse processes of the back.	Transversales cervicis.	
Ribs.	Cervicales descendentes.	
Spinous process of second cervical vertebra.	Obliqui capitis inferiores.	Transverse processes of atlas.
Transverse processes of the back.	*Semispinales colli.*	Spinous processes of the neck.
	Multifidi spinæ.	Ditto.
Transverse processes of the back.	*Complexi.*	Os occipitis.
Ditto	*Trachelo-mastoidei.*	Ossa temporum.
Transverse processes of atlas.	*Obliqui capitis superiores.*	Os occipitis.
Transverse processes of the neck.	*Recti capitis interni majores*	Ditto.
Transverse processes of atlas.	*Recti capitis laterales.*	Ditto.
	Scaleni.	Ribs.
Dorsal vertebræ.	*Longi colli.*	Cervical vertebræ.
	Levatores scapularum.	Scapulæ.
	Levatores breviores 2 costarum.	Ribs.
	2. DORSAL VERTEBRÆ.	
Ilia.	Quadrati lumborum.	Transverse processes of the loins; last dorsal vertebræ; last ribs.
Transverse processes of last vertebra; last dorsal vertebra; transverse process of the loins.	Psoæ magni.	Thigh bones.
	a. SPINOUS PROCESSES.	
Spinous process of the loins.	Spinales dorsi.	
Transverse processes of the back.	Semispinales dorsi	Spinous processes of the neck.
Transverse processes of the back and loins.	Multifidi spinæ.	

Origins.	*Muscles.*	*Insertions.*
Spinous processes of the neck.	*Trapezii.*	Scapula, clavicles, os occipitis.
Spinous processes of the loins and sacrum; cristæ of the ilia; ribs.	*Latissimi dorsi.*	Humeri.
Spinous processes of the loins.	*Serrati postici inferiores.*	Ribs.
Spinous processes of the neck.	*Serrati postici superiores.*	Ditto.
	Rhomboidei majores.	Bases of scapulæ.
	Splenii colli.	Transverse processes of the neck.
Transverse processes of the back.	*Biventres cervicis.*	Os occipitis.
	b. TRANSVERSE PROCESSES.	
Cristæ of ilia; spinous and transverse processes of sacrum and loins.	Longissimi dorsi.	Ribs.
	Semispinales dorsi.	Spinous processes of the back and neck.
	Multifidi spinæ.	Ditto.
	Semispinales colli.	Spinous processes of the neck.
Transverse processes of the neck.	*Complexi.*	Os occipitis.
Spinous processes of the back and neck.	*Biventres cervicis.*	Ditto.
Transverse processes of the neck.	*Trachelo mastoidei.*	Ossa temporum.
Transverse processes of the back.	*Transversales cervicis.*	Transv. processes of the neck.
	3. LUMBAR VERTEBRÆ.	
Ribs.	*Diaphragm.*	
Last vertebra, transverse processes of last dorsal vertebra.	*Psoæ magni.*	Thigh-bones.
	Psoæ parvi.	Ribs
	a. SPINOUS PROCESSES.	
Sacrum; transverse processes of the loins.	Multifidi spinæ.	
Ilia, spinous processes of sacrum, loins and back, ribs.	*Latissimi dorsi.*	Humeri.
Spinous processes of the back.	*Serrati postici inferiores.*	Ribs.
Ilia, ribs, spin. processes of sacrum, spinous and transverse processes of loins.	*Sacrolumbales.*	Ditto.
Ilia, spin. proc. of sacrum, spinous and transverse proc. of loins.	*Longissimi dorsi.*	Do. and trans. proc. of back.
Spinous proc. of sacrum, trans. of loins, ilia, Poupart's ligament.	*Obliqui externi abdominis.*	Ribs and linea alba.
	b. TRANSVERSE PROCESSES.	
Ilia.	Quadrati lumborum.	Last ribs, last dorsal vertebræ.
Ilia, spinous processes of sacrum and loins.	*Longissimi dorsi.*	Ribs and trans. proc. of the back.
Ilia, Ribs, spinous processes of sacrum and loins.	*Sacrolumbales.*	Ribs.
Sacrum.	*Multifidi spina.*	Spinous proc. of loins and back.
Ilia, sacrum, spin. proc. of loins, Poupart's ligament.	*Obliqui interni abdominis.*	Linea alba and ribs.
Ilia, Poupart's ligament.	*Transversi abdominis.*	Ditto
	4. SACRUM.	
	a. SPINOUS PROCESSES.	
Ilia, ribs, spin. proc. of loins and back.	*Latissimi dorsi.*	Humeri.
Ilia, spin. and trans. of loins Poupart's ligament.	*Obliqui interni abdominis.*	Ribs and linea alba.
Ilia, spin. and trans. proc. of loins.	*Longissimi dorsi.*	Transv. proc. of back and ribs.
Ilia, ribs, spin. and transv. proc. of loins.	*Sacrolumbales.*	Ribs.
Ilia, coccyx, transverse proc. of sacrum.	*Glutei magni.*	Thigh-bones and femoral vagina.
Ilia, transverse proc. of sacrum.	*Multifidi spina.*	Spinous processes of loins.
	b. TRANSVERSE PROCESSES.	
Ilia, spin. proc. of sacrum, coccyx, sacro-sciatic ligaments.	*Glutei magni.*	Thigh-bones and femoral vagina.

Origins	*Muscles.*	*Insertions.*
Ilia, spin. proc. of sacrum.	*Multifidi spinæ.*	Spinous processes of loins.
	Coccygei.	Coccyx.
	Curvatores coccygis.	Thigh-bones.
Ilia.	*Pyriformes.*	
	5. COCCYX	
Ischia.	*Coccygei.*	
Sacrum.	*Curvatores coccygis.*	
Pubes and Ischia.	*Levator ani.*	Sphincter ani, acceleratores urinæ, transversales perinei.
	XIV. RIBS.	
Ribs.	Intercostales.	
Transv. proc. of back.	Levatores longiores costarum.	
Transv. proc. of back and neck.	Levatores breviores costarum.	
Sternum ensiform cartilage.	Triangulares sterni.	
Spinous proc. of back and neck.	Serrati postici superiores.	
Spin. proc. of back and loins.	Serrati postici inferiores.	
Ilia, sacrum spin. and trans. proc. of loins.	Sacrolumbales.	
Ditto.	Longissimi dorsi.	Transv. processes of the back.
Ilia.	Quadrati lumborum.	Transv. proc. of loins, last ribs, last vertebræ.
Ilia and pubes.	Obliqui externi abdominis.	Linea alba.
Ilia, sacrum, obliqui externi, spin. and trans. proc. of loins.	Obliqui interni abdominis.	Ditto.
Trans. proc. of neck.	Scaleni.	
Ilia, obliqui externi, trans. proc. of loins.	*Transversi abdominis.*	Linea alba.
	Subclavii.	Clavicles.
Clavicles and sternum.	*Pectorales majores.*	Humeri.
	Serrati antici.	Scapulæ.
	Serrati magni.	Ditto.
Ilia, sacrum, spin. proc. of loins and back.	*Latissimi dorsi.*	Humeri.
	Accessorii ad sacrolumbalem.	Sacrolumbales
Lumbar vertebræ.	*Diaphragm.*	
	XV. CLAVICLES.	
First ribs.	Subclavii.	
Os occipitis, spin. proc. of neck and back.	Trapezii.	Scapulæ.
Sternum.	*Sternomastoidei.*	Ossa temporum.
Ditto.	*Sternohyoidei.*	Os hyoides.
Ditto and ribs.	*Pectorales.*	Humeri.
Spines of scapulæ.	*Deltoidei.*	Ditto.
	XVI. SCAPULÆ.	
Os occipitis, spin. proc. of neck and back.	Trapezii.	Clavicles
Spin. proc. of neck and back.	Rhomboidei.	
Transverse processes of neck.	Levatores scapularum.	
Ribs.	Serrati antici.	
Ditto.	Serrati magni.	
	Coraco-hyoidei.	Os hyoides.
	Supraspinati.	Humeri capsules of the joints
	Infraspinati.	Ditto.
	Teretes majores.	Humeri.
	Teretes minores.	Ditto and capsules
	Subscapulares.	Ditto.
Clavicles.	*Deltoidei.*	Humeri.
	Coraco-brachiales.	Ditto.
	Tricipites brachiorum (long hds.)	Ulnæ and humeri.
	Bicipites brachiorum.	Radii and cubital aponeuroses
	XVII. HUMERI.	
Clavicles scapulæ.	Deltoidei.	
Scapulæ.	Supraspinati.	Articular capsules.

Origins.	*Muscles.*	*Insertions.*
Scapulæ	Infraspinati.	Articular capsules
Ditto.	Teretes majores.	
Ditto.	Teretes minores.	Articular capsules
Ditto.	Subscapulares.	Ditto.
Ditto.	Coraco-brachiales.	
Clavicles, ribs, sternum.	Pectorales.	
Scapulæ.	Tricipites brachiorum (long heads).	Ulnæ.
Spin. proc. of sacrum, loins, and back, ilia, ribs.	Latissimi dorsi.	
	Tricipites brachiorum (short heads).	Ulnæ.
	Brachiales externi.	Ditto.
	Anconei.	Ditto.
	Brachiales interni.	Ditto.
	Supinatores longi.	Ditto.
	Radiales externi longiores.	Metacarpi of fore-fingers.
Ulnæ and articular capsules.	*Supinatores breves.*	Radii.
Radial condyles of humeri.	*Radiales externi breviores.*	Metacarpi of middle-fingers.
Ditto.	*Extensores communes digitorum.*	Digital phalanges.
Ditto.	*Extensores proprii auricularium.*	Phalanges of little-fingers.
Ditto.	*Ulnares externi.*	Metacarpi of little-fingers.
Ulnar condyles of humeri.	*Palmares longi.*	Palmar aponeuroses, annular ligaments.
Ditto.	*Radiales interni.*	Metacarpi of fore-fingers, ossa trapezia.
Ditto.	*Ulnares interni.*	Ossa pisiformia, annular ligaments.
Ditto.	*Pronatores teretes.*	Radii.
Radii and common origins of palmares longi, &c.	*Sublimes.*	Middle digital phalanges.

XVIII. ULNÆ.

Scapulæ humeri	Tricipites longi.	Articular capsules.
Ditto.	Tricipites breves.	Ditto.
Ditto.	Brachiales externi.	Ditto.
Ditto.	Brachiales interni.	Ditto.
Radial condyles of humeri.	*Extensores communes digitorum.*	Digital phalanges.
Ditto.	*Extensores proprii auricularium.*	Phalanges of little-fingers.
Ditto.	*Ulnares externi.*	Metacarpi of little-fingers.
Ditto.	*Radiales externi breviores.*	Metacarpi of middle-fingers.
Ulnæ.	*Indicatores.*	Phalanges of fore-fingers.
Ulnæ condyles of humeri.	*Palmares longi.*	Palmar aponeuroses, annular ligaments.
Ditto.	*Radiales interni.*	Metacarpi of fore-fingers, ossa trapezia.
Ditto.	*Ulnares interni.*	Ossa pisiformia, annular ligaments.
Ditto.	*Pronatores teretes.*	Radii.
Radii and common origins of palmares longi, &c.	*Sublimes.*	Middle digital phalanges.
Interosseous ligaments.	*Profundi.*	Distal digital phalanges.
Radii and interosseous ligaments.	*Abductores longi pollicum.*	Metacarpi of the thumbs, and sometimes ossa trapezia, and abductores breves.
Ditto.	*Extensores minores pollicum.*	Proximal phalanges of the thumbs.
Interosseous ligaments.	*Extensores majores pollicum.*	Distal phalanges of the thumbs.

XIX. RADII.

Scapulæ.	Bicipites.	Cubital aponeuroses.
Humeri.	Supinatores longi.	
Humeri, ulnæ, articular capsules.	Supinatores breves	
Vide supra in *humeri* et *ulnæ.*	Pronatores teretes. Pronatores quadrati.	
Vide supra.	*Ulnares externi.*	Metacarpi of the little-fingers.
Vide supra.	*Extensores communes digitorum.*	Digital phalanges.
Ulnæ (*sometimes*).	*Flexores longi pollicum.*	Distal phalanges of the thumbs.
Vide supra.	*Sublimes.*	Middle phalanges of the fingers

Origins.	*Muscles.*	*Insertions.*
	XX. CARPI.	
	1. OSSA PISIFORMIA.	
	Ulnares interni.	Metacarpi of the ring-fingers and annular ligaments.
Annular ligaments.	*Abductores digitorum auricularium.*	Proximal phalanges.
	2. OSSA TRAPEZIA.	
Ulnæ, radii, inteross. ligaments.	*Abductores longi pollicum.*	Metacarpi of the thumbs.
Ossa magna et unciformia.	*Opponentes pollicum.*	Ditto.
Ligaments of carpi.	*Abductores breves pollicum.*	Proximal phalanges of the thumbs.
Metacarpi of the thumbs, and sometimes of the fore-fingers.	*Abductores indicum.*	Proximal phalanges, tendons of the extensores.
	3. OSSA TRAPEZOIDEA.	
Ossa magna et unciformia metacarpi of the fore, middle, and ring-fingers.	*Flexores breves pollicum.*	Proximal phalanges.
	4. OSSA UNCIFORMIA.	
Vide supra	Ulnares interni.	Ossa pisiformia, metacarpi of the ring-fingers.
Ossa magna et trapezoidea metacarpi of the fore, middle, and ring-fingers.	*Flexores breves pollicum.*	Proximal phalanges.
Ligaments of carpi.	*Adductores metacarpi digitorum auricularium.*	Metacarpi of the little-fingers
Ditto.	*Flexores parvi digitorum auricularium.*	Proximal phalanges of the little-fingers.
	XXI. METACARPI.	
	1. OF THE THUMBS.	
Annular ligaments, ossa trapezia, magna et unciformia.	Opponentes pollicum.	
Ulnæ radii, inteross. ligaments.	Abductores longi pollicum.	Proximal phalanges of the fore-fingers.
Ossa trapezia, and sometimes metacarpi of the fore-fingers.	*Abductores indicum.*	
	2. OF THE FORE-FINGERS	
Humeri.	Radiales externi longiores.	
Ditto.	*Radiales interni.*	
	Interossei.	Proximal phalanges and tendons of the common extensors
Ossa trapezia, trapezoidea, magna et unciformia, metacarpi of the fore, middle, and ring-fingers.	*Flexores breves pollicum.*	
	3. OF MIDDLE FINGERS.	
	Radiales externi breviores.	Ditto.
Metacarpi of the fore and ring-fingers.	*Interossei.*	
	Abductores pollicum.	Proximal phalanges of the thumbs
	4. OF THE FORE-FINGERS.	
Metacarpi of the little fingers.	*Interossei.*	Proximal phalanges and tendons of the common extensors.
	5. OF LITTLE FINGERS.	
Vide supra.	Ulnares externi.	
Ossa unciformia, annular ligaments.	} Adductores metacarpi. } Digitorum auricularium.	
	Interossei.	Ditto

Origins.	*Muscles.*	*Insertions.*
	XXII. DIGITAL PHALANGES.	
	1. OF THE THUMBS.	
	a. PROXIMAL PHALANGES.	
Ulnæ interosseous ligaments.	Extensores minores pollicum.	
Ossa unciformia, trapezoidea, magna, metacarpi of the fore, middle, and ring-fingers.	Flexores breves pollicum.	By intervention of sessamoid bones.
Ossa trapezia, and annular ligaments.	Abductores breves pollicum.	
Metacarpi of middle fingers.	Adductores pollicum.	
	b. DISTAL PHALANGES.	
Ulna, interosseous ligaments.	Extensores majores pollicum.	
Ditto and radii.	Flexores longi pollicum.	
	2. PROPER DIGITAL PHALANGES.	
	a. IN GENERAL.	
Vide supra in humer. et uln.	Extensores communes.	
	b. PROXIMAL PHALANGES.	
Tendons of profundi.	Lumbricales.	Tendons of common extensors.
Metacarpi	Interossei.	Ditto.
	c. MIDDLE PHALANGES.	
Vide supra.	Sublimes.	
	d. DISTAL PHALANGES.	
Ulnæ, interosseous ligaments.	Profundi.	
	e. PECULIAR MUSCLES.	
Vide supra.	Extensores proprii digitorum auricularium.	
Ossa unciformia, annul. ligaments.	Flexores parvi digitorum auricularium.	Proxima phalanges
Ossa pisiformia, annul. ligaments.	Abductores digit. auricular.	Proximal phalanges.
Ulnæ.	Indicatores.	Tendons of common extensors.
Ossa trapezia, metacarpi of the thumbs.	Abductores indicum.	Proximal phalanges.
	XXIII. ILIA.	
Spinous processes of sacrum, loins, and back; ribs.	*Latissimi dorsi.*	Humeri.
Sacrum, spinous and transverse processes of loins.	*Longissimi dorsi.*	Ribs, transverse proc. of back.
Ditto.	Sacrolumbales.	Ribs.
Ossa pubis.	*Obliqui externi abdominis.*	Ribs, linea alba.
Obliqui externi, sacrum, spin. and transverse proc. of loins.	*Obliqui interni abdominis.*	Ditto.
Obliqui externi, trans. proc. of loins.	*Transversi abdominis.*	Ditto.
Ilio lumbar ligaments.	*Quadrati lumborum.*	Trans. proc. of loins, last ribs, last dorsal vertebræ.
Sacrum (sometimes).	*Iliaci interni.*	Thigh-bones.
Ditto.	*Pyriformes.*	Ditto.
Ditto, cocyx, sacra-lumbar ligam.	*Glutei magni.*	Ditto, and femoral vagina.
	Glutei medii.	Thigh-bones.
	Glutei parvi.	Ditto.
	Tensores vaginarum.	Ditto, rotula, tibia.
	Sartorii.	Tibia.
	Recti crurum	Ditto.
	XXIV. OSSA PUBES.	
	Psoæ parvi.	Last dorsal vertebræ and first lumbar.
	Recti abdominis.	Ribs.
	Pyramidales.	Recti, lineæ albæ.
	Pectinei.	Thigh-bones.
	Graciles	Tibiæ.
	Adductores longi.	Thigh-bones.
	Adductores breves.	Ditto.

Origins.	*Muscles.*	*Insertions.*
Ischia.	*Adductores magni.*	Ditto.
Ditto.	*Obturatores externi.*	Ditto.
Ditto.	Obturatores interni.	Ditto.
	XXV. ISCHIA.	
	Gemini.	Ditto.
	Semitendinosi.	Tibiæ.
	Semimembranosi.	Ditto.
Thigh-bones.	*Bicipites crurum.*	Fibulæ.
Pubes.	*Adductores magni.*	Thigh-bones.
	Quadrati femorum.	Ditto.
Pubes.	*Obturatores externi.*	Ditto.
Ditto.	*Obturatores interni.*	Ditto.
	XXVI. THIGH-BONES.	
Ilia, sacrum, coccyx.	Glutei magni.	Femoral vagina, rotulæ & tibiæ.
Ilia.	Glutei medii.	
Ditto.	Glutei parvi.	
Ilia, sacrum.	Pyriformes.	
Ischia.	Gemini.	
Ditto, and pubes.	Obturatores externi.	
Ditto.	Obturatores interni.	
Ischia.	Quadrati femorum.	
Ilia.	Tensores vaginarum.	Rotulæ and tibiæ.
Pubes.	Pectinei.	
Ditto.	Adductores longi.	
Ditto.	Adductores breves.	
Ditto, and ischia.	Adductores magni.	
Vertebræ and trans. proc. of loins, last vertebræ and trans. proc. of back.	Psoæ magni.	
Ilia, sometimes sacrum.	Iliaci interni.	
	Vasti externi.	Tibiæ and rotulæ.
	Vasti interni.	Ditto.
	Crurei.	Ditto.
	Gemelli.	Ossa calcis.
Capsules of knee-joints.	*Plantares.*	Ditto.
	Bicipites crurum, (short heads).	Fibulæ.
Capsules and semilunar cartilages.	*Poplitei.*	Tibiæ.
	XXVII. TIBIÆ.	
Ilia.	Sartorii.	
Pubes.	Graciles.	
Ischia.	Semitendinosi.	
Ditto.	Semimembranosi.	
Ilia.	Recti crurum.	Rotulæ.
Thigh-bones	Crurei.	Ditto.
Ditto.	Vasti interni.	Ditto.
Ditto.	Vasti externi.	Ditto
Ilia.	Tensores vaginarum femorum.	Thigh-bones and rotulæ.
Interosseous ligaments.	*Tibiales antici.*	Os cuneiforme internum and metatarsi of the great-toes.
Fibulæ.	*Extensores longi digitorum pedum.*	Phalanges of the lesser toes.
Ditto.	*Solei.*	Ossa calcis.
Ditto, and interosseous ligaments.	*Flexores longi digitorum pedum.*	Distal phalanges of the lesser toes.
Ditto.	*Tibiales postici.*	Ossa navicularia, unciformia, interna, media, externi, cuboidea, and calcis, metatarsi of the third toes.
	XXVIII. FIBULÆ.	
Ischia and thigh-bones.	*Bicipites crurum.*	
Tibiæ, femoral vaginæ, and tendons of bicipites.	*Peronei longi.*	Metatarsi of the great toes, ossa cuneiforma prima.
	Peronei breves.	Metatarsi of the little toes.
	Peronei tertii.	Ditto.
Tibiæ.	*Extensores longi digitorum pedum.*	Phalanges of the lesser toes.
	Extensores proprii pollicum pedum.	Phalanges of the great toes.
Ditto.	*Flexores longi pollicum pedum.*	Distal phalanges of the great toes.

Origins.	*Muscles.*	*Insertions*
	XXIX. TARSI.	
	1. OSSA CALCIS.	
Thigh-bones.	Gemelli.	
Tibiæ and fibulæ.	Solei.	
Thigh-bones, capsules, and semilunar cartilages.	Plantares.	
	Extensores breves digitorum pedum.	Tendons of long extensors, except those of the little toes.
	Flexores breves digitorum pedum.	Middle phalanges of the lesser toes.
	Massæ carnæ Jacobi Sylvii.	Tendons of the long flexors.
Ossa cuneiformia tertia.	*Flexores breves pollicum pedum.*	Proximal phalanges.
Ligaments round the astragali.	*Abductores pollicum pedum.*	Ditto.
Ossa cuboidea, cuneiformia tertia, tendons of peronei longi.	*Adductores pollicum.*	Ditto.
Metatarsi of the little toes, and plantar aponeurosis	*Abductores minimorum digitorum.*	Proximal phalanges of the little toes.
	2. OSSA NAVICULARIA.	
Fibulæ and interosseous ligaments.	Tibiales postici.	Ossa cuneiformia, and calcis, metatarsi of the third toes.
	3. OSSA CUBOIDEA.	
Ditto	Tibiales postici.	Ossa navicularia et cuneiformia; often ossa calcis, &c. Metatarsi of the third toes.
Ossa cuboidea et cuneiformia tertia, sometimes metatarsi of 4th, 3rd, and 2nd toes, trochlear ligaments of peronei longi.	*Adductores pollicum pedum.*	Proximal phalanges.
Trochlear ligaments, metatarsi of little toes, and sometimes plantar aponeuroses.	*Flexores breves digitorum minimorum.*	Proximal phalanges of little toes.
	4. OSSA CUNEIFORMIA PRIMA.	
Tibiæ and interosseus ligaments.	Tibiales antici.	Metatarsi of great toes.
Tibiæ, fibulæ, femoral vaginæ, and tendons of bicipites.	Peronei longi.	Ditto.
Tibiæ, fibulæ, and interosseus ligaments.	Tibiales postici.	Ossa navicularia, cuneiformia, secunda, tertia, cuboidea et calcis, metatarsi of third toes.
Metatarsi of first and second toes.	*Abductores indicum pedum.*	Tibial sides of proximal phalanges.
	5. OSSA CUNEIFORMIA SECUNDA.	
Tibiæ fibulæ, and interosseus ligaments.	Tibiales postici	Ossa navicularia, cuneiformia, prima, tertia cuboidea, et calcis metatarsi of third toes
	6. OSSA CUNEIFORMIA TERTIA.	
Plantar aponeuroses, ossa cuboid. and ligaments between the cuboid, cuneiform and heel bones.	Flexores breves pollicum.	Proximal phalanges.
Ossa calcis and ligaments of astragali.	*Abductores pollicum.*	Ditto
	XXX. METATARSI.	
	1. OF THE GREAT TOES.	
	Transversales pedum.	Metatarsi of little toes, &c.
Tibiæ, fibulæ, femoral vaginæ, and tendons of bicipites.	Peronei longi.	Ossa cuneiformia prima.
Metatarsi of second toes, and ossa cuneiformia prima.	*Abductores indicum pedum.*	Tibial sides of proximal phalanges.
	2. OF SECOND TOES.	
Metatarsi of great toes, and ossa cuneiformia prima.	*Abductores indicum.*	Ditto.
Metatarsi of third toes.	*Adductores indicum.*	Fibular sides of proximal phalanges.

Origins	*Muscles.*	*Insertions.*
	3. OF MIDDLE TOES.	
	Abductores digitorum tertiorum.	Tibial sides of proximal phalanges.
Metatarsi of fourth toes.	*Adductores digitorum tertiorum.*	Fibular sides.
	4. OF FOURTH TOES.	
	Abductores digitorum quartorum.	Tibial sides.
Metatarsi of little toes.	*Adductores digitorum quartorum.*	Fibular ditto.
	5. OF LITTLE TOES.	
Fibulæ.	Peronei tertii.	
	Transversales pedum.	Metatarsi of great and little toes Adductors of great toes.
Trochlear ligaments and ossa cuboidea.	*Flexores breves digitorum minimorum.*	Proximal phalanges of little toes.
Ossa calcis and plantar aponeuroses.	*Abductores digitorum minimorum.*	Fibular sides of proximal phalanges.
	Adductores digitorum minimorum.	Tibial ditto.

XXXI. PHALANGES OF THE TOES.

	1. PROXIMAL PHALANGES OF GREAT TOES.	
Fibulæ.	Extensores proprii, pollicum pedum.	Distal phalanges.
Ossa calcis, cuboidea et cuneiformia tertia.	Flexores breves pollicum pedum.	Proximal phalanges.
Ossa calcis and ligaments of astragali.	Abductores pollicum pedum.	
Ossa, calcis cuboidea et cuneiformia tertia, sometimes metatarsi of fourth, third, and second toes, trochlear ligaments.	Adductores pollicum pedum.	
Ossa calcis.	Extensores breves digitorum pedum.	Tendons of extensores proprii pollicum, et extensores longi, except those of the little toes.
	2. DISTAL PHALANGES OF GREAT TOES.	
Fibulæ.	Extensores proprii pollicum pedum.	Proximal phalanges.
Ditto.	Flexores longi pollicum pedum.	
	3. PHALANGES OF LESSER TOES.	
	a. IN GENERAL.	
Tibiæ and Fibulæ.	Extensores communes longi.	
Ossa calcis.	Extensores breves.	Tendons of extensores, proprii pollicum, et extensores longi, except those of the little toes.
	b. PROXIMAL PHALANGES.	
	Interossei.	Tendons of long flexors.
Tendons of long flexors.	Lumbricales.	Ditto.
	c. MIDDLE PHALANGES.	
Ossa calcis and plantar aponeuroses	Flexores breves perforati.	
	d. DISTAL PHALANGES.	
Tibiæ and Fibulæ.	Flexores perforantes.	
	4. PECULIAR MUSCLES.	
Trochlear ligaments, metatarsi of little toes, ossa cuboidea.	Flexores breves digitorum minimorum pedum.	Proximal phalanges.

The following table of muscles, arranged according to their compound motions, we likewise copy from the Encyclopædia Perthensis, which is extracted from Dr. Barclay's work on Muscular Motions. It will be seen, that in reference to the particular muscles, we have combined an account of the uses of these organs with their structure and localities; thus departing from the principle of limiting this article to mere Anatomy. The reason of so doing, must, however, be obvious to the reader; for it is clear that the physiological account of muscles cannot, in the article Physiology, be extended beyond the rationale of muscular agency generally.

TABLE OF THE COMPOUND ACTIONS OF THE PRINCIPAL MUSCLES OF THE HUMAN BODY.

THE HEAD IS MOVED

STERNAD by	DORSAD by	ROUND ON THE NECK by	LATERAD generally by
Recti capitis interni minores.	Recti capitis postici.	Latissimi colli.	Those muscles which move it *sternad* and *dorsad*, acting in concert, opposing each other, and in some measure by one of each pair, acting without its fellow of the opposite side.
Recti capitis interni majores.	Obliqui capitis superiores.	Splenii capitis.	
Recti capitis interni laterales.	Splenii capitis.	Splenii colli.	
Latissimi colli.	Complexi.	Recti capitis postici majores.	
Biventres maxillæ *seu* digastrici.	Trachelo-mastoidei.	Obliqui capitis inferiores.	
Sterno-mastoidei.	Trapezii *(partly)*.	Trachelo-mastoidei, *all of which draw the head dextrad.*	
Mylo-hyoidei.		Sterno-mastoidei.	
Genio-hyoidei.		Complexi.	
Genio-hyoglossi.		Trapezii *(partly)*.	
		All drawing sinistrad.	

THE NECK IS MOVED

STERNAD by	DORSAD by	DEXTRAD by	SINISTRAD by
Latissimi colli.	Trapezii *(partly)*.	The *dextral* muscles on the *sternal* and *dorsal* aspects acting at the same time.	The sinistral muscles on the *sternal* and *dorsal* aspects acting at the same time.
Digastrici.	Rhomboidei minores.		
Mylo-hyoidei.	Serrati postici superiores.		
Genio-hyoidei.	Splenii capitis.		
Genio-hyoglossi.	Splenii colli.		
Coraco-hyoidei.	Complexi.		
Sterno-hyoidei.	Trachelo-mastoidei		
Thyro-hyoidei.	Cervicales descendentes.		
Sterno-mastoidei.	Transversales cervicis.		
Recti capitis interni minores.	Spinales et semispinales cervicis.		
Recti capitis laterales.	Multifidi spinæ.		
Longi colli.	Recti capitis postici minores.		
Scaleni antici.	Recti capitis postici majores.		
	Obliqui capitis superiores.		
	Obliqui capitis inferiores.		
	Scaleni postici.		
	Levatores scapulæ.		

THE TRUNK IS MOVED

STERNAD by	DORSAD by	DEXTRAD by the *dextral*	SINISTRAD by
Pectorales.	Trapezii	Obliqui abdominis.	The *sinistral muscles of the same names, when not acting at the same time with their fellows on the dextral side.*
Serrati antici.	Rhomboidei majores.	Rectus abdominis.	
Serrati magni.	Latissimi dorsi.	Psoæ.	
Obliqui abdominis externi.	Serrati postici superiores.	Latissimus dorsi.	
Obliqui abdominis interni.	Serrati postici inferiores.	Serratus posticus.	
Transversi abdominis.	Sacrolumbales.	Sacro umbalis.	
Recti abdominis.	Longissimi dorsi.	Longissimus dorsi.	
Pyramidales.	Spinales et semispinales dorsi.	Quadratus lumborum, *when not acting at the same time with their fellows on the sinistral side.*	
Psoæ magni.	Multifidi spinæ.		
Psoæ parvi.	Intertransversarii.		
	Quadrati lumborum.		

THE SCAPULA IS MOVED

ATLANTED by

Trapezius, *partly.*
Levator scapulæ.
Rhomboideus.

STERNAD by

Serratus magnus.
Serratus anticus.
Pectoralis.
Levator scapulæ.
Subclavius.

MESIAD by

Serratus anticus.
Pectoralis, *partly.*
Latissimus dorsi.
Rhomboideus.

SACRAD by

Serratus anticus.
Pectoralis.
Latissimus dorsi.
Subclavius.

DORSAD by

Trapezius, *partly.*
Latissimus dorsi.
Rhomboideus.

LATERAD by

Serratus magnus.
Levator scapulæ.

DORSO-MISIAD by

Trapezius.

THE HUMERUS IS MOVED

STERNAD by

Deltoideus, *partly.*
Supraspinatus.
Infraspinatus.
Subscapularis.
Biceps flexor cubiti.
Coraco brachialis.
Pectoralis, *partly.*

DORSAD by

Deltoideus, *partly.*
Teres major.
Teres minor.
Triceps brachii *(long head).*
Latissimus dorsi.

MESIAD by

Pectoralis, *partly.*
Latissimus dorsi.

LATERAD by

Deltoideus.
Supraspinatus.
Infraspinatus.
Subscapularis.
Biceps flexor cubiti.
Coraco-brachialis.

In a Rotatory Motion. RADIAD by

Supraspinatus.
Infraspinatus.
Teres minor.
Deltoideus *partly.*
Coraco-brachialis. *(in a slight degree).*

In a Rotatory Motion. ULNAD by

Subscapularis.
Deltoideus, *partly.*
Pectoralis, *partly,* } *when first rolled radiad.*
Latissimus dorsi, } *when first rolled radiad.*
Teres major, } *when first rolled radiad.*

THE FORE-ARM IS MOVED

THENAD (or bent) by

Biceps flexor cubiti.
Brachialis internus.
Supinator longus.
Ulnaris internus.
Palmaris longus.
Pronator teres.
Radialis internus.
Sublimis.

ANCONAD (or extended) by

Triceps brachii.
Anconeus.

THE RADIUS IS ROLLED

ULNAD (or to the prone position) by

Pronator teres.
Pronator quadratus.
Palmaris longus.
Radialis internus.
Sublimis.

RADIAD (or to the supine position by)

Biceps flexor cubiti.
Supinator brevis.
Extensor major pollicis.

THE CARPUS IS MOVED

THENAD by

Radialis internus.
Ulnaris internus.
Palmaris longus.
Sublimis.
Profundus.
Flexor pollicis longus.

ANCONAD by

Radialis externus longior.
Radialis externus brevior.
Extensor pollicis major.
Indicator.
Extensor digitorum communis.
Extensor digiti auricularis.

RADIAD by

Abductor pollicis longus.
Extensor pollicis minor.
Radialis externus longior,
Radialis externus brevior.
Radialus internus.

ULNAD by

Ulnaris externus.
Extensor minimi digiti.
Extensor digitorum communis.
Ulnaris internus.
Sublimis.
Profundus.

THE THUMB IS MOVED

THENAD by	ANCONAD by	RADIAD by	ULNAD by
Abductor pollicis longus.	Adductor pollicis.	Abductor pollicis longus.	Opponens pollicis.
Abductor pollicis brevis.	Flexor pollicis brevis.	Abductor pollicis brevis.	Abductor pollicis brevis.
Opponens pollicis.	Extensor pollicis minor.	Extensor pollicis minor.	Abductor pollicis.
Flexor pollicis longus.		Flexor pollicis brevis *(partly)*.	Flexor pollicis brevis.
Abductor indicis.			Extensor pollicis major.

THE FINGERS ARE MOVED

THENAD (or bent) by	ANCONAD (or extended) by	Some of them RADIAD by	Some of them ULNAD by
Sublimis.	Extensor digitorum communis.	Abductor indicis.	Abductor digiti minimi.
Profundus.	Indicator.	Adductor metacarpi digiti minimi.	Interossei.
Lumbricales.	Extensor digiti minimi.	Interossei.	
Interossei.			
Abductor indicis.			
Flexor digiti minimi brevis.			
Abductor digiti minimi.			

THE THIGH IS MOVED

DORSAD, or extended by	STERNAD, or inflected by	LATERAD, or abducted by	MESIAD, or adducted by
Gluteus maximus.	Sartorius.	Tensor vaginæ femoris.	Adductores omnes.
Gluteus medius *(partly)*.	Gracilis.	Glutei omnes	Pectineus.
Gluteus minimus *(partly)*.	Tensor vaginæ femoris.	Pyriformis	Quadratus femoris.
Pyriformis.	Pectineus.	Sartorius.	Gracilis.
Obturator internus.	Adductores, longus et brevis.	Obturator internus.	Semitendinosus.
Gemini.	Adductor magnus *(partly)*.	Gemini.	Semimembranosus
Quadratus femoris.	Iliacus internus.		Biceps cruris *(partly)*.
Abductor magnus *(partly)*.	Psoas major.		Obturator externus.
Biceps cruris *(partly)*.	Obturator externus.		Psoas major.
Semitendinosus.	Gluteus minor.		Iliacus internus.
Semimembranosus.			

THE THIGH IS ROLLED

FIBULAD by	TIBIAD by
Gluteus maximus.	Tensor vaginæ.
Gluteus medius *(partly)*.	Gluteus medius *(partly)*.
Gluteus minimus *(partly)*.	Gluteus minimus.
Pyriformis.	Sartorius.
Gemini.	Gracilis.
Obturatores utriqui.	Semitendinosus *(when the leg is extended)*
Quadratus femoris.	
Iliacus internus.	
Psoas major.	
Adductores omnes.	
Biceps cruris *(partially, when the leg is extended)*.	

THE LEG IS MOVED

STERNAD, or extended by	DORSAD, or inflected by
Rectus cruris.	Gracilis.
Vasti utriqui.	Sartorius.
Cruralis.	Semitendinosus.
Tensor vaginæ femoris.	Semimembranosus.
Gluteus maximus.	Biceps cruris.
	Gemellus.
	Plantaris.
	Popliteus.
	Tensor vaginæ femoris.
	Gluteus maximus.

THE TARSUS IS MOVED

ROTULAD by	POPLITEAD by	FIBULAD by	TIBIAD by
Tibialis anticus.	Gemellus.	Peronei omnes.	Tibialis posticus.
Extensor digitorum longus.	Soleus.	Extensor digitorum longus.	Extensor pollicis proprius.
Extensor pollicis proprius.	Plantaris.		Flexor digitorum longus.
Peroneus tertius.	Flexor digitorum longus.		
	Flexor pollicis longus.		
	Tibialis posticus.		
	Peroneus longus.		
	Peroneus brevis.		

THE TOES ARE MOVED

ROTULAD, or extended by	POPLITEAD, or inflected by	FIBULAD by	TIBIAD by
Extensor digitorum brevis.	Flexor digitorum longus.	Interossei fibulares	Interossei tibiales.
Extensor digitorum longus.	Flexor digitorum brevis.	Transversi pedis.	Abductor pollicis.
Extensor pollicis proprius.	Flexor pollicis longus.	Adductor pollicis.	
Lumbricales *(occasionally)*.	Flexor pollicis brevis.	Abductor minimi digiti.	
Interossei *(occasionally)*.	Adductor pollicis.		
	Abductor pollicis.		
	Flexor minimi digiti brevis.		
	Abductor minimi digiti.		
	Lumbricales } *(occa-*		
	Interossei } *sionally)*.		

OF THE ORGANS OF SENSE AND PARTS CONNECTED WITH THEM.

In the following description of the organs of sense, it will be seen that we comprehend the eye, the ear, the nose, and the mouth, or the organs of sight, of hearing, of smell, and of taste. The organ of the remaining sense, namely, that of general feeling, if there be any propriety in considering this a distinct sense, is usually said to be the skin, or common integument, with which the surface of the body is everywhere covered, and which is described in another part.

188. The *eye*.—Under this denomination we include the eye-ball, the nerve of the eye, its muscles, the eye-lids, the eye-brows, the lachrymal gland, and the passages for the tears.

189. The *eye-ball*.—This is made up of certain coats and humours, as they are called. It resembles somewhat a sphere; its average dimensions have not been satisfactorily ascertained. The coats proper to this substance are described as three proper and one adjunct. The three proper coats of the organ are the sclerotica, the choroid, and the retina. The humours are the aqueous, the crystalline, (lens), and the vitreous.

190. *The adjunct or conjunct coat of the eye.* (*Tunica conjunctiva* or *adnata.*)—This is merely a reflection of the skin from the lids of the eye, which passes over the fore part of the eye-ball; it does not appear, however, to be continued over the transparent portion of the eye which is called the cornea, although many anatomists have stated this to be the case. There is a small quantity of cellular substance found between this reflected coat and the sclerotic.

191. The *sclerotic coat.*—This is white and opaque: it is of a compact fibrous structure and completely envelopes the ball of the eye, excepting the corneal or transparent part. This last, the cornea, is then the convex transparent portion of the eye-ball; it is made up of several laminæ united together by cellular substance, and has by some been described as the transparent part of the sclerotic; it is, however, distinct in its structure from that membrane.

192. The *choroid coat.*—This is less firm and dense than the sclerotic. It is exceedingly vascular. The ancients supposed it to be a continuation of the pia mater, as they imagined the sclerotic to be of the dura mater.

193. The *retina* is still considered by many anatomists an expansion of the optic nerve: certain it is, that the nerve thus named expands into, or is, as it were, lost by the formation of a very delicate pulpy substance, which extends from the posterior part of the eye forward as far as the greater diameter of the capsule of the crystalline lens, immediately to be noticed.

194. The *humours of the eye.*—Of these the *aqueous* is situated foremost. It is remarkably pellucid; it is divided, as we shall immediately see, into two chambers, the anterior and posterior. The *crystalline* lens is situated behind the aqueous humours, and its posterior portion is imbedded in the vitreous humour. The lens is made up of concentric layers united to each other by cellular substances. Its shape is spheroidal, more convex behind than before. The *vitreous* humour occupies the greater share of the whole eye-ball. It is gelatinous, resembling the unboiled white of an egg. It lies behind the lens; and its anterior part is rendered concave by the lens being, as we have said, imbedded in it. The lens and the vitreous humour are each contained in distinct membranes called capsules, which are thin and pellucid.

195. The *iris.*—This is an opaque membrane lying behind the cornea, and floating in the aqueous humour. It is of different colours in different individuals, and is that part of the eye from which the colour of the organ is designated. In the centre of this membrane there is a perforation called the pupil of the eye. The iris is fibrous, or muscular, and inherently moveable. It is by this substance that the aqueous humour is divided into anterior and posterior chambers; the first being placed between the back part of the cornea and the fore part of the iris; the second between the posterior surface of the iris and the anterior portion of the lens. Immediately under the iris the ciliary processes are found; these pass in parallel lines from the circumference to the centre; they seem to be rather vascular than muscular, although some have supposed the contraction and dilutation of the pupil to depend upon their action: other anatomists have described them as mere doublings of the choroid coat, their extremities hanging loose in the aqueous humour.

196. On the internal surface of the choroid coat, between it and the retina, a substance is found called *nigrum pigmentum;* this is thicker and darker in the negro than it is in the European; the choroid coat, with the margin of the iris, is connected with the sclerotic by a gray ring of thick cellular membrane, which is named the *ciliary circle* or *ligament;* and a triangular canal has been described by Fontana and others as running along the ciliary ligament, and as being partly formed by the groove at the edges of the cornea and sclerotic coat.

197. *Optic nerve.*—Anatomists have generally described these nerves as originating from the thalami nervorum opticorum; others have considered their origin to be from the nates and testes (see the anatomy of the brain pan). The two nerves unite at the fore part of the cella turcica, and, then separating, pass obliquely forward through a foramen in the sphenoid bone, entering, as we have before said, the globe of the eye, to be expanded into the retina. The optic nerves are of a very considerable size; they are very white, and are enveloped by the membranes of the brain.

198. *Muscles of the eye-ball.*—Five of the six muscles which are destined for the motion of the eye take their origin from the sides of the optic foramen; the sixth takes its origin from the anterior part of the orbit. They terminate in broad thin tendons upon the sclerotic coat under the tunica conjunctiva, about one-sixth of an inch from the cornea. The muscles are the *levator oculi*, or rectus superior; *depressor oculi*, or rectus inferior; the *abductor* and *adductor*, and the *superior* and *inferior oblique* muscles.

199. The levator oculi is the thinnest of the recti muscles; it begins from the upper part of the side of the optic foramen.

200. The depressor takes its rise from the lower part of the optic foramen; and is fixed opposite to the insertion of the former in the sclerotic coat.

201. The abductor oculi originates from the lower and back part of the fissure of the orbit, and becomes fixed in the ball of the eye opposite to its outer angle. The adductor (which is the shortest and thickest, as the levator is the thinnest of the straight muscles) originates from the side of the optic foramen, and terminates opposite to the inner angle of the eye.

202. The superior oblique arises from the side of the optic foramen; its tendon passes through a cartilaginous pulley, fixed behind the internal angular process of the frontal bone; it is afterwards reflected under the levator muscle, and is fixed in the sclerotic coat between the insertion of the levator, and entrance of the optic nerve. The inferior oblique arises from the anterior edge of the orbitar process of the upper maxillary bone; and is inserted in the sclerotic coat between the entrance of the optic nerve and the insertion of the abductor muscle.

203. The uses of the first four muscles may be inferred from their names: viz. to raise, depress

bring the ball in towards the nose, and pull it towards the temple. By the superior oblique the pupil is turned downwards and outwards; and upwards and inwards by the inferior.

204. *Eye-lids.*—These are composed of muscular fibres, adeps, and common integuments; and are lined, as we have said, by the tunica conjunctiva, which is thence reflected and spread over the eye itself. Each lid has a cartilage at its edge, forming what is called the tarsus, which is broadest in the centre, and the edge is so shaped as to form a groove for the tears when the lids are closed. On the edges of these lids a row of hairs is implanted which are called *cilia* or *eye-lashes*, and those of the upper lid are longer than those on the lower; their direction is also rather upwards, while the cilia of the under eye-lid are turned downwards. At the roots of these hairs, between the tarsus and lining of the lid, are found a number of follicles called ciliary glands.

205. *Eye-brows.*—These are arched eminences covered by hair, extending from the nose to the temples. They are formed of a thick folding of the common integuments. They have a muscle attached to them by which their motions are considerably regulated. This, the *corrugator supercilii*, with other muscles near and in connection with it, will be found described in the general description of the muscles. The eye-brows are well nigh peculiar to the human species.

206. *Lachrymal gland.*—This is of a yellowish colour, and consists of many lobules; it is found at the outer and upper part of the orbit; it has ducts which pass out from the fore part of the gland separately; they are usually found to be five or six in number, and they terminate on the inner side of the upper eye-lid near to the outer angle of the eye.

207. *Lachrymal passages.*—As the lachrymal gland is situated at the outer and upper angle of the orbit, so at the inner corner of the eye between the eyelids is found a small reddish body, which is called *caruncula lachrymalis;* and close to this caruncle, but separated by it, are two *puncta* or holes, one in each eye-lid; they are orifices to canals which pass into the lachrymal sac; they sometimes unite and form a common duct, which passes behind the tendon of the orbicularis muscle; but generally their termination is into the sac separately. The *lachrymal sac* is lodged in a groove formed by the os unguis, and superior maxillary bone; it is of an irregular shape, approaching somewhat to an oval; at its lower extremity, where it is connected with the nasal duct, it is a little contracted. Its composition is that of a tough mucous membrane. The *nasal duct* is enclosed in a bony canal, which runs from the sac downwards and obliquely backwards, and terminates at the lower end of the inferior turbinated bone on the schneiderian membrane of the nostrils.

208. The blood-vessels and nerves of the eye will be found described in another place, where their general distribution is traced.

209. *Of the ear and its appendages.* The ear of the human subject is usually distinguished into external and internal: the first including that part which is vulgarly called the ear, with the passage from this as far as the tympanum, or drum; and the second those parts which are interior in reference to the tympanum.

210. The external ear is made up principally of cartilage; but it is attached to the temporal bone by integuments, by ligament, and by muscles. The strictly cartilaginous portion of the external organ, is called ala, or wing, to distinguish it from the fleshy pendent portion below, which is named the lobe. The outer border of the cartilaginous part is called helix, and the semicircle within this is named antihelix. The little moveable cartilage placed immediately before the entrance into the meatus is named tragus, and an eminence opposite to this, at the extremity of the antihelix, is called antitragus. The cavity between the helix and antihelix is the innominata; and the boat-like cavity between the limbs of the antihelix is called scapha, or fossa, navicularis. The central hollow whence proceeds the meatus is named concha. Upon the cartilages of the ear are implanted a few thin fibres; but the muscles which move the whole external cartilage of the organ are the following: The *attollens aurem*, or temporo-auricularis, which arises by a curved line from the tendinous aponeurosis of the temporal muscle, and by a broad tendinous expansion it is fixed to the eminence on the inner side of the antihelix. This muscle serves for the purpose of raising the cartilage of the ear; but very few persons possess much extent of power over it. The *zygomato-auricularis*, or anterior auris. This arises from that portion of the temporal muscle which covers the middle of the zygoma; it passes backwards and downwards, and is implanted into the inner side of the helix, which it draws forward. The *retrahentes aurem*, or mastoido-auricularis forms three muscles, which originate from the back part of the root of the mastoid process, and are inserted into the projection which corresponds with the hollow of the concha: they have power over the width of the concha. The five small muscles on the external cartilage of the ear have been named the *tragicus*, *antitragicus*, the *transversus auris*, and the *helix major* and *minor;* the situations of which may be known from their names.

211. The *meatus auditorius* at its opening is cartilaginous; and through its course to the membrane of the drum it is lined with a thin secretory membrane; it is not straight, but bends forwards and inwards. The *membrana tympani* is of an oval shape; it is placed obliquely in a groove of bone, the upper part of it being directed outwards, and the under inwards. This membrane has recently been considered fibrous, the fibres of it radiating.

212. *Internal parts of the ear.*—There are two cavities in the internal ear, viz. the *tympanum* and the *labyrinth*. The first of these cavities communicates with the back part of the fauces by means of the Eustachian tube, which commences at the upper and anterior part of the tympanum, and is directed forwards and inwards; the narrowest part of this tube is that in connection with the tympanum, as it approaches the fauces it becomes wider, and is here cartilaginous. Like the meatus externus it is lined by a vascular

membrane. The Eustachian tube is the internal meatus of the ear.

213. The tympanum further communicates at its upper and posterior part with the cells of the mastoid process of the temporal bone.

214. Across the tympanum four bones are, as it were, stretched: these are named the *malleus*, *incus*, *orbicular bone*, and *stapes*. They are each covered by periosteums, and connected together by capsular ligaments. The malleus is so named from its resemblance to a hammer. The incus, to which the malleus is articulated, is likewise named from its resemblance to an anvil; this last consists of a body and two crura, the shorter of which extends backwards, and has a ligamentous connection with the edge of the mastoid opening; while its long process is articulated to the os orbiculare, which thus joins the stapes, or stirrup bone: this is placed horizontally, and is divided into a head, crown, and base. These several bones are moved by the following muscles, viz. the *levator tympani*, the *tensor tympani*, and the *stapedius*. The first, also called obliquus externus, arises from the spinous process of the sphenoid bone, and passing through a fissure in the temporal bone, is fixed in the long process of the malleus. The tensor tympani arises from the cartilaginous part of the Eustachian tube, and is fixed into the posterior part of the handle of the malleus. This muscle is also named obliquus internus or trochlearis. The stapedius arises from a channel in the petrous bone near the cells of the mastoid process; its tendon passes on to be inserted into the back part of the head of the stapes. The uses of these bones and muscles we shall consider more at large in the article Physiology.

215. The labyrinth is of an irregular form; it is much smaller than the tympanum. Its whole internal surface is said to be lined with a very delicate membrane, which sometimes exhibits an appearance of considerable vascularity, and adheres everywhere to the bone. Within this are found in the vestible two membranous sacs, which do not seem to have any communication with each other; but from the larger one, which is more oblong than the other, three membranous canals extend into the three semicircular canals of the bone. The membranous sacs and the membranous canals appear to contain a thin watery fluid; and between them and the vascular lining of the labyrinth already mentioned, there seems to be a small quantity of a similar fluid.

216. The three semicircular canals just named communicate with the vestible by five openings, two of them having a common termination. They are improperly named *semi*-circular, since they form in their turnings the greater portion of a circle. The vestible further communicates with the *cochlea*, which is thus named from its resemblance to a shell, which is made up of two complete turns and a half. These turns are separated from each other by a partition into two windings; the one communicating with the tympanum, the other with the vestible. It is to the whole of these parts that the term labyrinth is made to apply. The proper nerve of the organ of hearing is the portio mollis of the seventh part, which branches upon the internal cavities of the ear. The other nerves of the ear, with the blood-vessels, &c. will be found traced in other parts of the present article.

217. *Organ of smell.*—The *nose* is made up of bony and of soft parts. The bones which enter into the composition of this organ will be found stated under the general description of bones. We may here mention that the frontal bone, the os nasi, and the maxillary bones form the upper and fore part of the organ. The ethmoid and the ossa unguis make up its lateral portion; while the under, inner, and posterior part is formed by the superior maxillary, the inferior spongy, the sphenoidal, and the palatine bones, with the vomer. The septum of the nose, by which it is divided into two cavities, is composed of the descending plate of the ethmoid bone of the vomer, and a connected cartilage.

218. What are called the internal nares are two cavities placed between the outer nares and the posterior openings of the organ into the throat. Of the opening into the nose one is found above the turbinated processes of the ethmoid bone, one between these and the inferior spongy bones, and one below the inferior turbinated bones: through this last a probe may be easily passed into the throat.

219. The soft part of the nose is made up of fine cartilages, ligaments, membranes, muscles, and integuments. The largest cartilage is placed in the middle, and is the base upon which the lateral cartilages are fixed. This also constitutes, as we have said, a share of the septum; it is fixed to the vomer, to the spinous processes of the upper maxillary bones, and to the fore part of the nasal plate of the ethmoid. The lateral cartilage, which is placed anteriorly, is bent forward to form the tip of the nose; and the posterior cartilages constitute the ala nasi.

220. The muscles which move the nose are that part of the occipito-frontalis which is fixed into the nose, the compressor narium, and the levator and depressor of the upper lip, and ala nasi. The membrane, by which the whole internal cavity of the nose is lined, has its free surface vascular and villous; its attached surface is smooth and silvery, like tendon. The membrane lining the cells and sinuses which communicate with the nose is considerably different, being thinner and not so vascular; its free surface is likewise less villous, and the other surface does not show any tendinous appearance.

221. The olfactory nerves are traced by anatomists from the corpora striata of the brain; these will be found in the general description of the nervous system.

Of the Mouth, Pharynx, &c.

222. When the jaws are closely shut, the mouth may be regarded as consisting of two regions; an external and internal, separated from each other by the teeth and gums. The external region is formed by the cheek and lips without, and by the teeth and gums within. The internal region is bounded before and laterally by the teeth and gums, below by the tongue, above by the hard palate, and behind by the soft palate. Between the soft palate, however, and posterior part of the tongue there is an opening, variable

in its dimensions according to the will of the individual which leads into the pharynx or fauces.

223. The *palate* or roof of the mouth is constituted of hard and soft parts; the hard portion consists of the palatine portion of the upper maxillary bones, and of the palate bones, forming together an arch: it is throughout lined by a membrane which is similar in structure to the gum, and indeed a continuation of it. What is called the soft palate is that membranous fleshy substance, which is suspended from the middle of the palate bones over the basis of the tongue, and from the centre of which that pendulous conical-shaped body named uvula takes its origin. The two bodies called tonsils are placed one on each side the lateral edge of the palate; these are soft and grayish-coloured glands, of an oval shape, nearly of the size of an almond; they are cellular in structure, having external openings, and are lined by the membrane which lines the general cavity of the mouth. Besides the tonsils, there is a number of small glands about the soft palate which have been called palatine; these are similar to the labial glands.

224. The *tongue* is supported, as we have before said, by the os hyoides; its sides are fixed to the styloid processes, and to the inferior maxilla, by ligaments. The organ itself is made up of various muscles, lined by a membrane continued from the gums; and under this membrane, towards the root of the tongne, the small lingual glands are situated. These, with the labial and and pharyngeal glands, constitute the smaller glands of these parts; but the more important and proper salivary glands are the three bodies called the parotid, the submaxillary, and sublingual.

225. The *parotid* occupies the space between the angle of the lower jaw, the meatus of the ear, and the mastoid process; its form is oval; from its upper part it sends out a large duct, which is of a paler colour in the adult than in the fœtus. This gland is made up of several lobes, which are united by intermediate cellular substance, each lobe being again composed of several lobuli or parts; these send out ducts which eventually unite into the large or proper duct of the organ, which takes a horizontal direction over the masseter muscle, pierces the buccinator muscle, and opens between the second and third of the upper molares teeth. The duct is small in diameter: it has two coats; the external one cellular, the internal muco-membranous.

226. The *submaxillary* gland is situated more under the jaw; it is, however, often continued on as far as the angle of the jaw, and connected with the lower portion of the parotid. The duct perforates the membrane of the mouth by the side of the frænum linguæ; it is comparatively large.

227. The *sublingual* gland is placed immediately under the tongue; its duct opens into the duct of the submaxillary, or a little to the outside of the frænum linguæ.

228. The *pharynx* is situated behind the tongue, upon the bodies of the cervical vertebræ, with which it has a connection by a cellular substance. It is connected to the sphenoid and occipital bones superiorly; below it is attached to the gullet, and the larynx is situated anteriorly to it. The sides of the pharynx are bounded by the pterygoid processes of the os sphenoides, and the horns of the os hyoides.

229. On the top and anterior part of this cavity the right and left cavities of the nose open. Immediately below is the soft palate, and to this succeeds the pharyngeal orifice into the mouth. Below this orifice again, is situated the opening of the glottis with the epiglottis on its upper and fore part; and under this there is a slight convexity, which terminates the pharynx anteriorly. On each side of the pharynx, at the top are found the cartilaginous orifice of the Eustachian tubes leading into the ears. The pharynx is lined at its roof by a membrane similar to that which lines the hard palate. The membrane of its posterior and lateral parts is similar to that which covers the inner orifice of the cheeks.

230. *Fascia of the Head.*—The fascia of the head is constituted by the tendinous expansions of the occipito-frontalis, and the other muscles which lie under the integuments of the cranium; over the surface of the bones, and in immediate connection with them, is extended the membrane which is called pericranium; it is the same as the periosteum in other parts; this membrane, the periosteum, being a general covering to the external surface of bones.

Of the Parts and Organs contained in the Cavity of the Thorax, with the exception of the Heart and great Blood-vessels, and of the External Parts of the Thorax.

231. *The Lungs.*—'These organs,' says Dr Gordon, 'may be regarded as consisting of two parts; a peculiar substance and a serous membrane called the pleura, which covers the whole outer surface of this substance.' This membrane, the pleura, is reflected back upon the whole internal surface of the thoracic cavity, so as to be an interior lining to this, as well as an external covering to the lungs themselves. The reflection of this membrane over the lungs is in such sort, that each side has a complete investment, so that one lobe does not communicate with the other. The right and left lobe of the lungs are not however exactly equal, the right being broader and shorter than the left. Where the two reflections of the pleura meet at the anterior part of the chest, the partition, called anterior mediastinum, is formed, which is connected with the sternum and cartilages of the ribs of the left side of the chest. These reflections of the pleura, which thus form the mediastinum anterior, are not in actual contact with each other; the substance called the thymus gland being placed between them; there is another separation of these reflected portions of the pleura to form a triangular space at the posterior part of the chest's centre. This is called the mediastinum posterior, and within it are found the aorta, the œsophagus, the lower end of the windpipe, lymphatic glands, and nerves.

232. The mass of the lungs corresponds in figure with the thorax which contains them. They are in themselves, as unconnected with blood, of a grayish or pale colour. They commu-

nicate to the touch a spongy feeling. The lobes are subdivided into three on the right side and two on the left. Of the air-cells, which are terminations of the bronchial tubes, nothing certain has been ascertained respecting their shape and size; it is also still uncertain whether they communicate directly with each other by lateral openings or otherwise. Towards the surface of the lungs they are evidently without this communication. It is supposed by some of the best informed anatomists, that each air-cell is directly and distinctly supplied by an actual continuation of a bronchial tube. Neither is the precise manner ascertained in which the minute arteries and veins terminate and commence with respect to the air-cells. It has been estimated that their surface is much greater than that of the whole skin.

233. The *trachea*, or wind-pipe, is placed at the anterior part of the neck; it divides nearly opposite to the third vertebra of the back into two great branches, called *bronchi*, one of which goes to the left, the other to the right lung; the left of the bronchi is the smallest in diameter and longest; it passes under the arch of the aorta before it enters the substance of the lungs; the right dips immediately into the lungs. These two terminations of the trachea divide into a great number of small branches; and eventually, as above intimated, terminate in the air-cells of the organs. Now the trachea itself is made up of several cartilages connected together by ligamentous membrane, they are continued round about two-thirds of the circumference of the organ; its back part, where it is in connection with the œsophagus being not cartilaginous. The cartilages when the division is made into bronchi become regular segments, and the smaller divisions of the bronchi form new membranous tubes. The trachea is lined by a very irritable membrane of the mucous kind, which is continued down through the ramifications of the bronchi. Its cartilages, as we have said, are connected by a ligamentous membrane; and between this and the mucous lining, muscular fibres are described by some anatomists, as arranged circularly and longitudinally; others are not satisfied that these exist.

234. The *larynx*, of which the trachea is a sort of continuation, is placed between this and the os hyoides; it is made up of cartilages, connected together by ligaments, membranes, and muscles. The size of this organ varies much in the two sexes, being considerably broader in the male than in the female, and more prominent anteriorly. 'It contains,' says Dr. Gordon, 'two compartments, an upper and a lower, which communicate with each other by a narrow passage. The upper compartment is usually called *glottis*, and the aperture by which it communicates with the lower one, the *rima* of the glottis. The edges of this slit are pretty sharp, and the term *vocal cords* has frequently been applied to them. It seems to us, however, better to relinquish this appellation, since it implies an hypothesis with respect to the functions of the rima of the glottis, which, if not incorrect, is at least very doubtful, see PHYSIOLOGY. The cartilages of the larynx are the following:—The *thyroid*, which is the largest, and occupies the fore part and sides of the organ; it consists of two wings, which, being united anteriorly, form that prominence in the fore-part of the neck which is much more observable in the male than in the female, and is called the pomum Adami. The *cricoid*, which constitutes the base on which the thyroid and arytenoid are fixed through the media of articulating surfaces. Its lower part, being placed horizontally, is connected with the superior portion of the trachea. The two *arytenoids*; these constitute the most important part of the larynx. They are of a triangular form, with their points directed backwards. They are connected with each other by the laryngeal membrane, and by muscular fibres; they are also united to the epiglottis by a fold of membrane on each side, which constitutes the lateral parts of the superior opening of the larynx. The *epiglottis*; this, although described by some anatomists as one of the laryngeal cartilages, is merely the defence of the opening into the larynx; it is of a ligamento cartilaginous structure; it in figure somewhat resembles the tongue; when raised it is placed perpendicularly, but when the tongue is depressed, or the individual swallows, it is pressed down, and thus made to cover the passage into the larynx. This substance is connected laterally to the whole length of the arytenoid cartilage, and at its under end it is united by a ligament to the thyroid gland. This last substance, the *thyroid gland*, is placed immediately under the larynx, on the outside of the trachea; it is covered by the sterno-thyroid, sterno-hyoid, and omo-hyoid muscles. It is made up of two distinct lobes, and these lobes are subdivided into smaller lobules. The *bronchial* glands are those bodies of a dark purple appearance which are found at the inside of the trachea, where the division is made into its two great branches.

External Parts of the Thorax.

235. The external parts of the thorax are constituted of the ribs laterally, sternum anteriorly, and vertebræ posteriorly, as the bony portion; the pectoral and intercostal, and other muscles, as the fleshy portion; and over the whole are placed the common integuments or skin. The *mammæ*, or *breasts*, while they are covered anteriorly by common integuments, adhere by their internal surface to the great pectoral muscle, through the intervention of cellular membrane; the breasts of the male, which are comparatively small and simple in their structure, are termed mamillæ; in the female they vary much in size and appearance at different periods and under different circumstances. At birth, indeed, they are of equal size in both sexes; they are composed of glandular or secretory follicles, lactiferous ducts, adipose substance, blood-vessels, nerves, and lymphatics. Before their development they consist of mere cutaneous tubercles, of a reddish colour, called nipples, being surrounded by a brownish disc termed areola. When the breast of the female is developed at puberty, its glandular portion is separated into parts from which the lactiferous ducts originate; these, in their course, are accompanied

by a ligamentous elastic substance, which terminates with them at the nipple. That portion of the mammæ which is not glandular consists of adeps, and on the under surface of the areola sebaceous glands are situated.

Of the Alimentary Canal, and Abdominal Viscera.

236. The alimentary canal commences with the pharynx and terminates at the rectum. The pharynx has just been described. The gullet or œsophagus, the stomach, and the intestines, remain to be noticed in this division of the subject.

237. The *œsophagus* is placed behind the trachea, between it and the cervical vertebræ, first making an inclination to the left, but from the fifth to the ninth vertebra inclining rather to the right side, in order to accommodate itself to the descending aorta. It is of musculo-membranous construction; and composed, according to some anatomists, of five, according to others of four coats; viz. an outer cellular structure; a fibrous tunic, these fibres being placed longitudinally in the first instance, and circularly under; then there is what some describe as the nervous, others cellular coat, which connects the fibrous with the mucous or interior surface; this lies in some parts in folds, and it is plentifully supplied with mucous follicles or secretory orifices, which orifices are especially numerous at the part where the organ terminates in the stomach.

238. The *stomach*.—The figure of this capacious organ has been compared to the bag of a bagpipe, large and capacious at one end, contracted and small at the other. It is placed immediately below the diaphragm, obliquely, between the spleen on the left, and the liver on the right side; it occupies the larger share of the epigastric region, and a considerable portion of the left hypochondrium. It has two arches or curvatures; one large, running along the largest convexity of the organ, the other small, being directly opposite to the former. Its two openings are, first, the *cardia*, which constitutes its junction with the œsophagus; the second, or exit opening, is called the *pylorus*, by which it joins the commencement of the intestinal canal. The coats of the stomach, like those of the gullet, are differently conceived and described, according as the cellular matter connecting the muscular with the internal tunic is, or is not, considered distinctly; some have called this the nervous coat. The peritoneal coat, however, the fibrous, and the internal, or villous, are unequivocal. These fibres are longitudinal and circular. The innermost, or villous coat, is of much more ample surface than the others, and lies in folds, which are especially numerous about the pylorus. The internal surface of the stomach is a mucous membrane, and otherwise secretory of a peculiar liquor, see Physiology. Careful dissection discovers a fine net work of veins between the villous and muscular coats of the stomach.' The peritoneal tunic of this organ is throughout pretty uniform in thickness, but both the fibrous and the villous coats vary as to this particular, both in different stomachs, and in different parts of the same stomach. Whether this is the case before death, seems, however, uncertain.

239. The *intestines* in their whole length are five or six times the length of the whole body. Their coats are the same as those of the stomach, peritoneal, muscular, and villous or mucous; this last is also much more extensive in its surface than the others, and therefore falls into plaits or folds forming what are called the valvulæ conniventes. The names of the intestines are duodenum, jejunum, ilium, cæcum, colon, and rectum; the three first constituting what are called the small intestines, the others the large.

240. The *duodenum* is so named from its being about twelve inches long. It commences from the pylorus, and first turns upwards and backwards a little, then directly down under the neck of the gall-bladder; it takes then an oblique direction to the right side, and again crosses the lumbar vertebræ to appear in the left hypochondrium; it ends in the jejunum.

241. The *jejunum* is called thus from its generally being found empty. Its precise commencement from the duodenum is not defined; its situation is in the umbilical region, and it constitutes a little more than a third of the small intestines.

242. The *ilium*, so named from its numerous turns and twinings commencing from the jejunum, lies in the umbilical and hypogastric regions, and partly in the cavity of the pelvis; its large circumvolution covers the cæcum, which is the first of the large intestines; it opens into its left and posterior part.

243. The *cæcum*.—This is rather a paunch at the commencement of the colon than of and in itself one of the intestines. It is placed in the cavity of the os ilium on the right side. At this part there is a valve found, which is made up by two folds of the internal coat of the intestine situated transversely. There is a little appendix to the cæcum, called from its resemblance to a worm, the vermiform appendix; it is cylindrical in its shape, is about four or five inches long, and ends in a *cul de sac*.

244. The *colon* ascending from the cæcum passes over the right kidney, goes upwards and backwards under the liver, then crosses the body from right to left under the gall bladder, stomach, and spleen; on the left side it descends, and in its descent at the lower part forms what is called its sigmoid flexure; from this the intestine afterwards descends into the pelvis and forms the bowel named

245. The *rectum;* this, indeed, in strictness of language is an actual continuation of the last wind of the column; it is irregularly cylindrical, and falls into doublings. It is capable of considerable extension, and thus with the colon lodges the fæces. Its extremity is called *anus*, which is provided with the following muscles. The *sphincter*, the *levator*, and the *transversalis perinæi*.

246. The *sphincter ani* consists of two layers of fibres, which cross each other and are united in a point. It is connected posteriorly to the os coccygis by a ligamentous substance, and hence has been named the coccygi-cutaneo sphincter. It has likewise connexion anteriorly with the

accelerator urinæ, the transversalis perinœi, and levator ani.

247. The *levator ani* takes its rise from the arch of the pubes, from the obturator internus aponeurosis, from the os coccygis, and from the spine of the ischium. In its insertion it is incorporated with the fibres of the sphincter and accelerator urinæ.

248. The *transversalis perinæi* originates from the interior of the tuberosity of the ischium, and is inserted into the back part of the accelerator urinæ. The use of the two first muscles may be inferred from their names. This last assists the motions of the rectum, and serves to dilate the bulb of the urethra.

249. The large intestines differ from the small by having on their outside three ligamento membranous bands externally, which run through their whole length; on the rectum they unite and form but two; these bands support the pouches into which the large intestines are divided. In the lesser intestines there is a sort of valvular formation, and these valves are most numerous near the stomach. The duodenum, or first of the small intestines, differs from the others in being more capacious, more curved, provided with a greater number of valvulæ conniventes, and being fastened in its position posteriorly, while the others are loose and moveable. A glandular structure is evident through the whole course of the intestines.

Of the Peritonæum, Mesentery, and Omentum.

250. The *Peritonæum*.—As the thoracic cavity and contents have a lining and enveloping membrane, so has the abdominal cavity and the principal parts of its contents; this last is the peritonæum which is a firm though thin membrane lining the parietes of the abdomen and then reflected over the viscera. This, like the *pleura*, is a serous, not a mucous membrane; it is expanded in different places into a kind of ligamentous support to the viscera; this is especially the case with respect to the liver; it has also several productions, as they are termed, or doublings, the principal of which are—the mesentery, mesocolon, and omentum.

251. The *mesentery* is that doubling of the peritonæum back upon itself after having enveloped the intestines, which, passing from one portion of the vertebræ to the other, at once binds them down from entanglement, and permits a certain extent of floating motion. That part of this peritonæal production which thus encloses the convolutions of the small intestines is named mesentery peculiarly, while that which serves the same purpose to the colon is denominated meso *colon*; the mesentery is fixed to the vertebræ of the loins.

252. The *omentum* is also formed of a doubling of the peritonæum; this membrane instead of being fixed falls loosely over the surface of the intestinal mass. It is divided into three portions by anatomists: viz. into the omentum magnum, parvum, and colicum. The greatest omentum hangs down from the greater curvature of the stomach and is fixed to the colon; it is therefore called omentum gastro colicum, or colico gastricum, as well as omentum magnum. That part of the peritonæum which passes off double from the concave part of the liver to the lesser curvature of the stomach is the omentum parvum or hepato-gastricum; near the commencement of this there is an opening through which the finger may be passed, and the whole paunch distended with air. This opening has been named, or rather the part into which it leads, the capsule of Glisson. The omentum colicum commences at the anterior part of the cæcum and right side of the colon: it forms a sort of membranous coat to the colon and cæcum.

Of the Assistant Chylopoetic Viscera: viz. the Liver, Gall-bladder, Spleen, and Pancreas.

254. The *Liver*, which is the largest gland of the body, has its situation principally in the right hypochondrium, but it stretches also across the epigastric into the left hypochondric region. It is naturally of a brownish red colour. It varies in size and weight in different individuals; its average weight however is said to be between two and four pounds troy. The exterior surface of the liver is convex, its interior is concave, and in contact with the exterior surface of the diaphragm. This organ is fixed in its situation by peritonæal processes which are named ligaments, with some analogical impropriety. That membranous which connects the upper side of the organ with the diaphragm is called the suspensory or falciform ligament. The lateral portions of this suspensory ligament which are fixed to the sides of the body have been called distinctly ligamenta lata. What is called the round ligament of the liver (ligamentum teres) is that portion of the falciform which constitutes its under rounded part; it is merely the umbilical vein of the fœtus condensed or shrivelled into membranous substances: it connects the liver with the navel. The coronary ligament is that reflection of the peritonæum which connects its posterior and middle part with the diaphragm; a portion of the membrane stretching between the liver and the right kidney, has been named the hepatic renal ligament; and another portion of peritonæum which extends from the organ across the duodenum to the colon has been called the hepatico-colic.

The liver is divided into two great lobes: the right and the left; the first being by far the largest. There is a prominence on its under surface, something in form and appearance like the tongue; this has been named the third lobe or lobule of Spigelius. Between this and the right or large lobe there is a passage for the vena cava, and upon its under surface, in a depression, are likewise lodged part of the colon, the right kidney, and renal capsule.

256. The *gall-bladder* also is situated upon the under and concave part of the liver. This organ is of a pear-like shape, but varies much both in magnitude and figure in different individuals; it has a peritonæal investment and a mucous membrane externally, and between these tunics there is likewise a fibrous structure: upon its internal surface there are a great many rugæ which give the appearance to the part somewhat like a honey-comb. The gall-bladder stretches itself

out into a neck which, doubling as it were upon itself, gives origin to a duct (the *cystic*) which joins the duct from the liver, immediately to be described, (the *hepatic*) and the junction being made, the duct, receives the name of *ductus communis choledicus*, which passes on into the duodenum, entering this gut obliquely, about three or four inches from the pylorus. These ducts have fibrous and mucous coats. They are remarkably dilatable. The muscular structure of the ducts has been questioned by some, and the fibres are for the most part very small and pale. The hepatic duct is equal in size to a common writing pen. The cystic duct is smaller. At the part where the common duct enters the duodenum there is a small projection upon the bowel.

257. Respecting the structure of the liver, 'a good deal, (says a modern author of eminence) is stated as fact which I apprehend is yet matter of conjecture. Besides the absorbents which it possesses in common with other organs, four systems of vessels are distributed through it; viz. the ramifications of the hepatic artery, the hepatic veins, the portal vein (*vena portæ*) and the biliary vessels. Injection enables us to trace each of these systems to a great degree of minuteness within the substance of the liver; but the exact termination or commencement of any of them is not known. In forming our opinion in the mean while on this subject, it will be proper to keep in recollection, the direction in which the fluids have been ascertained to flow within these different vessels in the living body. By two of these systems, viz. the hepatic artery and the portal vein, (see the description of these vessels in the account of the circulation) blood is constantly entering the liver, and by the other two, viz. the hepatic veins and the biliary vessels, fluids are perpetually leaving this organ. It is exceedingly improbable therefore that the branches of the two former should communicate with each other as those of the two latter.

258. 'Whether the hepatic artery and portal vein communicate with the hepatic veins alone, or both with the hepatic veins and biliary duct, cannot, it seems to me, be decided by simply injecting a thin fluid like water into either of the trunks in the dead body, and observing by what channel it escapes. For in the first place, transudation is a source of fallacy in all experiments of this kind; and secondly, allowing that no transudation took place, a direct communication between any two of these opposite systems of vessels might open an indirect channel for the fluid through the branches of the other two.

259. 'The portal vein has been said somewhat to resemble an artery in its structure; but I have never been able to discover any similarity between them. It has always appeared to me to have the same composition as the other veins of the body.'

260. Beside the peritonæal coat which invests the liver there is also a sort of condensed cellular texture which surrounds it, and dips into its substance, enveloping some of the larger branches of its blood-vessels. The blood-vessels, nerves, &c. of this organ are described in other parts of the present essay.

261. The *spleen* is situated in the left hypochondrium, between the stomach and the false ribs. It is of a spongy consistence, generally of rather an oval form, and like the liver convex upon its upper surface to answer to the concavity of the diaphragm; its length is usually about five or six inches. Sometimes it is divided into lobules. It has two coats, one peritonæal and the other proper to it. Its natural colour is rather livid; it has been compared to cast-iron. It has no excretory duct. It is connected to the pancreas by blood-vessels and membranes.

262. The *pancreas*, or sweet-bread, is a gland which resembles the salivary glands. It lies across the upper and posterior part of the abdomen before the aorta, vena cava, part of the vessels belonging to the spleen, and part of the duodenum. Its length is about six inches. Its shape has been compared to a dog's tongue. It is divided into lobules each of which has a duct which joining, form the principal duct of the organ; this beginning from the left extremity becomes gradually larger, and runs along to the duodenum to be inserted together with, and in some instances only very near to, the ductus communis choledicus, into the duodenum. Where this gland is connected with the curvature of the duodenum a sort of process or elongation is found which has a separate duct that eventually however joins the larger duct. Sometimes it enters the duodenum separately.

Of the Kidneys, and their Appendages, and of the Urinary Bladder.

264. The *kidneys* are situated at the sides of the spine, in the upper part of the loins; the right one being a little lower than the left on account of the liver being of greater bulk than the spleen; the right kidney being placed just under the former, the left under the latter organ. They are about five inches long; they resemble in figure the kidney bean. When cut into, the kidney exhibits two different substances, one called cortical, the other tubular; the last is of a lighter colour than the first, and is composed of small tubes; the first is in appearance granular, and more like the appearance of the parenchyma of the liver. The small tubes of the tubular portion of the organ are represented as collected into conical-shaped bodies, named papillæ, and thence into larger tubes, or infundibula; these last being eventually combined into three large trunks, constitute the cavity called the pelvis of the organ. From these the *ureter* takes its origin, which is a tube about the size of a goose-quill, and about a foot in length, which thus arising from the pelvis of the kidney, runs down to be inserted into the bladder. There is one of course to each kidney; occasionally there are two. The ureter, as it enters the urinary bladder runs some way obliquely between its coats.

265. The *glandulæ renales*, as they are improperly called, are two bodies situated immediately above the kidneys, to which they adhere by cellular substance; they have no excretory duct, but in their interior is found often a sooty-coloured or bilious-looking fluid. These bodies scarcely attain any increase of size after birth

In a young fœtus they are seen larger than the kidney.

266. The *urinary bladder* is placed in the lower part of the pelvis behind the ossa pubis, to which it is connected by a cellular structure, and by ligaments. It is nearly of a triangular figure, when undistended. Its size is proportionably larger in infancy than in adult age. Its coats are three, or according to some four, viz. The peritonæal, which however, is not a complete investment, only the upper and back part of the organ being covered by peritonæum. The muscular or fibrous, and the internal or mucous membrane. Between the tunics there is a considerable quantity of cellular membrane, which is by some anatomists considered as a distinct investment or separate coat. The inner membrane of the bladder is exceedingly sensible. It is strictly, however, a mucous surface. The muscular fibres, which are about the neck of the bladder, constitute what is called the *sphincter* of the organ. The *detrusor* urinæ is constituted by its fibrous coat.

Of the Generative Organs in the Male.

267. These are partly within and partly without the abdomen. They consist of the *testes* and their appendages, the *vesiculæ seminalis*, and the *penis*.

268. The *testes*.—These are loosely situated in a sort of membranous pouch, called the *scrotum*. This testicle has properly but two coats, viz. the *tunica vaginalis*, and *tunica albuginea*. The scrotum itself is membranous, and highly contractile; and some authors speak of the membranous and muscular substance of this pouch as coats of the testicle, the latter under the name of dartos; they are, however, not strictly *tunics* of the organ; and indeed the substance called dartos, seems rather membranous than muscular. The vaginal tunic is continued from the peritondem; and, enclosing the testicle, forms a short sac. Within this coat the albuginea is found, which is thick and white, and closely adheres to the body of the testicle. The testicles are of a glandular structure and brown colour.

269. The *vas deferens*. On the upper part of the testicle the *epididymis* is situated, which is a hard convoluted body, from the posterior and inferior part of which originates the vas deferens which passes from the epididymis along with the blood-vessels of the organ, from which it separates when it has arrived among the abdominal muscles, and passing downwards and backwards along the psoas muscle, comes nearly in contact with its fellow in the vicinity of the prostate gland, and they both eventually fall into the *vesiculæ seminalis*.

270. These, the *vesiculæ seminalis* are two bodies of a tubular structure, but which appear as if they were composed of irregular vesicles or cells. They are placed obliquely under the bladder, near its neck, in such a manner as almost to touch at their points; they terminate by a cylindrical canal or duct in the urethra at the side of an eminence called *caput gallinaginis*, which is constituted by a fold of the urethral membrane, and situated at the under side of the urethra, near the neck of the bladder.

271. The *prostate gland* lies between the vesiculæ seminalis and penis, under the pubic bones; it is of a firm dense structure, somewhat like a chestnut in figure, and is divided by a fissure into two lobes. It is connected to the rectum. Part of the levator ani muscle stretches its fibres over the substance, and the muscle thus formed is called the compressor of the prostate. Several ducts leading from the prostate open obliquely into the urethra around the openings from the seminal ducts.

272. The bodies called *Cowper's glands*, which are found on each side of the bulb of the urethra are about the size of a pea, each having a separate duct which likewise enters into the urethra, in an oblique manner. These glands are not always to be found.

273. The *penis* is composed of two parts, the *corpora cavernosa*, and *corpus spongiosum*. The former are two tubes, which make up the greatest portion of the organ; they are united laterally to each other by an imperfect partition, so that there is a communication between them; posteriorly these divisions of the organ divaricate from each other, and becoming gradually smaller and smaller, they are attached to the inferior portions of the os pubis on either side. The corpus spongiosum of the penis begins from the prostate, and surrounds the canal of the urethra; it terminates in that exterior expansion which is called the *glans*, an exceedingly vascular part. The penis is covered by common integuments; the skin, being reflected back from the glans, covers it when the organ is in a relaxed state; and this covering is named prepuce, which is tied down to the inferior part of the glans by a process of integument, named *frænum*. The *urethra* is a membranous canal, which passes the whole way from the neck of the bladder, through the penis; its direction is first under and then before the pubis. The muscles of the organ are the *erector penis*, and the *accelerator urinæ*, the first taking its origin from the tuberosity of the ischium, and terminating by a flat tendon into the part where the corpora cavernosa are in conjunction; the second originates tendinous from the commencement of the corpus cavernosum of the penis, being connected within the sphincter ani, and is inserted at the middle of the bulb of the urethra. These muscles are in pairs.

The Female Organs of Generation.

274. These are divided into external and internal, the latter including the *vagina*, *uterus*, *ovaria*, and appendages; the first comprising the *mons veneris*, the *labia*, *external* and *internal*, and the *clitoris*.

275. The *vagina*, which is the channel of communication between the uterus and external organs, is placed between the urinary bladder and the rectum; its texture is membranous, the internal surface being rugous, and secreting a mucus; its orifice is about half an inch below the conjunction of the pubic bones, termed the symphisis; in virgins its aperture is very small, being contracted by a fold of membrane of a semilunar shape, named *hymen*, in the superior part of which there is an opening, in some cases exceedingly small, in others larger. This membrane is ruptured by coition.

276. The *uterus*, between the urinary bladder and the rectum, is situated at the termination of the vagina. It in figure bears some resemblance to a flattened pear; in the virgin state it is not of greater capacity than to contain the kernel of a nut; but after impregnation it is much larger, never falling again into its original smallness. It is divided into fundus, body, neck, and mouth, the last being named *os tincæ*. The uterus is connected to the sides of the pelvis by ligaments, and by cellular membrane; a doubling of the peritonæum, extending from the sides of the uterus to either side of the pelvis, forms the *ligamenta lata* of anatomists. The sides of the uterus are exceedingly thick, so that its internal cavity bears but a small proportion to its external bulk. It is lined internally by a vascular and mucous membrane, which at its neck are formed into rugæ; the mucous follicles are at this part likewise in greater numbers than at other parts of the organ. The parietes of the uterus are fibrous in their structure.

277. The *ovaria*. These have been denominated by some the female testicles. They are two spongy yellowish-coloured bodies, situated near the sides of the uterus; they are of a flattened oval form, and somewhat resemble the testes of the male, but not much more than half their size, even at the time of their greatest magnitude.

278. The *Fallopian* tubes are two canals of a cone-like shape, included in doublings of the ligamenta lata, each being fixed by its narrowest extremity to the corners of the fundus uteri, into which it opens by an exceedingly small orifice: from this it goes in rather a curved manner towards the ovaria, and expands eventually into fimbriated or fringe-like processes, which embrace the ovaria during coition.

279. The *mons veneris* is placed upon the symphisis of the pubis, it is a considerable rising of fat, which is covered by hair, and there is a doubling of the skin on each side descending from the symphisis pubis, and uniting about an inch from the anus; these doublings form the external *labia pudendi*. Upon separating these a small red body is seen, about an eighth of an inch in length, of a spongy texture, and of a form and internal construction a good deal like the penis of the male. This is the *clitoris*, which possesses very great sensibility, has a præputium and glands like the male penis, and is attached to the symphisis pubis by a suspensory ligament. Its commencement is by two crura from the ossa ischia. It has no perforation. The *internal labia*, or *nymphæ*, are internal doublings of the skin which descend from the frænum of the clitoris on each side the orifice of the vagina. These parts are exceedingly vascular. They are occasionally extended so as to project beyond the external labia. The nymphæ being separated, an orifice is seen about an inch below, which is the commencement of the urethra, this is found just above the orifice of the vagina.

Of the External Parts of the Abdomen, and of the Abdominal and Pelvic Fasciæ.

280. The term abdomen is applied to all that part of the body which is situated between the thorax and the pelvis. Behind it is bounded by a portion of the spinal column and muscles of the loins, and at its sides and front by abdominal muscles, a description of which will be found in another division of this treatise. Then we have the common integuments over the whole, and the external parts are divided by anatomists in a sort of geographical manner, for the purpose of more accurately indicating the localities of the different viscera and internal parts. An imaginary line is drawn from the one to the other cartilage of the eighth rib, and the middle of the space above this line is named the *epigastric* region, the lateral parts being called the *hypochondriæ* right and left. Then another line is drawn between the anterior spinous processes of the ossa ilia, the central part above this line being called the *umbilical* region, and the lateral spaces the *lumbar*; the middle part below the line is named the *hypogastric* region, while the lateral spaces of the same division are called the *iliac* regions. It is necessary for the student to retain these divisions in his memory, because anatomical and medical teachers make use of them in their discourses and writings.

281. We may here take occasion to say that the abdominal and thoracic cavity are separated internally by the *diaphragm*, or midriff, which is chiefly made up of muscular fibres, but its middle portion is tendinous. By the expansion of this fibrous membrane between the chest and abdomen a plane transverse division is not effected, but the direction of the organ is such as to form a kind of vault, the fore part of which is attached to the sternum, while the posterior, which is its lower portion, is attached to the vertebræ of the loins: laterally it is fixed to the lowest of the true ribs and to all the false ribs. Through the tendinous portion of this muscular septum, pass the great blood-vessels, &c. as described in other parts of the present treatise.

282. There are two fasciæ peculiar to the abdomen, the one of which is superficial and membranous, and is seen immediately upon removing the common integuments from the abdomen; it is described by some as taking its rise from the inferior part of the tendon of the external oblique muscle, see Table of Muscles, 174; it extends down, covers the spermatic cord and ligaments of the uterus, and also some of the inguinal glands, occasionally being traceable for about six or eight inches down the thigh.

283. *Poupart's ligament*, according to more modern phraseology the *crural arch*, is constituted by a process of the tendon belonging to the external oblique muscle of the abdomen, which is stretched thicker and stronger than in any other part of it between the symphisis of the pubis, and the anterior superior spinous processes of the ilium, it is somewhat rounded, especially towards the os pubis. About an inch, or sometimes considerably more from the symphisis of the pubis, the tendon of the external oblique muscles is generally divided into an upper and under column, and between these a space intervenes, rather of an oval figure, which has been usually called the *spermatic* ***ring***, but which some have proposed to name the *under inguinal*, or *abdominal aperture*. To this a thin

portion of tendon is fixed, which passes downwards, and is attached to the glutœus maximus and triceps adductor muscles of the thigh. The interior or posterior margin of the crural arch is intimately interwoven with the tendinous fascia that covers the iliacus internus, and psoas magnus muscles, which is connected to the crista of the ilium, and to the pubic ligament; it is also connected with that membranous fascia which covers the transverse muscles as far as that part of the thigh where the iliac artery emerges from the pelvis. On the side of the anterior iliac vein, next the pubis, there is an *aperture* called *crural*, which is nearly of an oval figure, and larger in the female than in the male. It is further necessary to state that the muscles of the thigh are covered by a strong tendinous aponeurosis called *fascia lata*, which takes its rise from the outer rounded portion of the crural arch from the pubis, and from the spine of the ilium. Upon these membranous extensions, tendinous insertions, fasciæ, and foramina, we shall have occasion to enlarge in the article SURGERY, especially under the head of HERNIA.

OF THE HEART AND OF THE BLOOD-VESSELS.

In the first part of the present essay the reader will find a general description of the heart; we now proceed to particularize.

284. The *heart* is generally described as being contained in a capsule called the *pericardium*; in strictness, however, of language, the organ may be said to be outside this membrane, which is double, and reflected back upon itself. The pericardium is of a fibro-tendinous structure, exceedingly smooth on its internal surface, and constantly lubricated by a serous fluid. The external coat of this membrane is constituted by a reflection of the pleura. The pericardium adheres also to the tendinous part of the diaphragm, and in part to its muscular portion, and is moreover connected with the anterior mediastinum.

285. The situation and connections of the heart are the following: its lower surface is somewhat flattened, resting upon the diaphragm; its anterior surface is opposed to the sternum; it is placed behind the breast-bone, and the cartilages of the true ribs, having its base turned towards the right side of the breast-bone, and its apex directly forwards, and towards the left side so that when its point is raised by the actions of the organ, it is raised between the lobes of the left lung, and is felt striking the side between the fifth and sixth rib.

286. The *ventricles of the heart*, we have already said, ought to be rather called anterior and posterior, or pulmonic and systemic, than right and left; the first of these is somewhat triangular in its form, internally very unequal owing to those little bodies called *columnæ carnæ*. The parts which communicate with this right or anterior, or pulmonic ventricle, are the anterior auricle, and the artery through which the blood flows to the lungs, it is called the *pulmonary* artery. The auricle is situated on the right, and rather towards the back of the heart; upon laying it open its internal surface is found to resemble the internal surface of the ventricle itself; its columniæ carniæ in their arrangement have been thought to resemble the teeth of a comb, and have thence been named *musculi pectinati*. The parietes of the auricle are not so thick as those of the ventricle. Into this auricle the venæ cavæ and the coronary vein enter; the first returning the blood from all parts of the body, the second from the heart itself. Between the auricle and ventricle a valve is found, which consists of a circular fold of thin membrane, so constructed as to fall close down upon the sides of the cavity when the blood is entering the ventricle from the auricle; this valve, from being divided into three portions, is called *tricuspid*; it is raised up by the contraction of the ventricle.

287. The *pulmonary artery* proceeds directly from the anterior ventricle; at the exit of this vessel from the ventricle there are likewise valves, formed by reflections or doublings of its internal coat; they are also three in number, of a somewhat semilunar figure, and yield in the same manner as the tricuspids to the stream of blood, opposing also in like manner its reflux.

288 The *posterior* or *systemic* ventricle is much thicker than the other, it is likewise rather smaller in its cavity, and more rounded in its shape; the valve of this ventricle, that is the valve which is situated between it and its corresponding auricle, is composed of only two parts, instead of three like the other, and it has been named mitral from its having been supposed to resemble the mitre of a bishop. Into the auricle of this part of the heart open the four pulmonary veins from the lungs; and from this ventricle issues the large artery of the body named *aorta*. In the size and form of the two auricles there is not much difference, the anterior one is rather the broadest, while the posterior one is a little longer than the other. At the commencement of the aorta are valves similar to those found at the mouth of the pulmonary artery.

289. We now proceed to treat on the *distribution of the blood-vessels*; but it will be necessary first to trace in very general terms the course of the blood to, through, and from the heart: the rationale of the circulation or disquisition upon the principles by which this is effected we defer till the drawing up of the article PHYSIOLOGY.

The blood returning from all the parts of the body, is poured into the anterior auricle by means of the superior and inferior cava; the first bringing it from that part of the body which is above the heart, the second from the larger and lower part; from the anterior auricle the blood is transmitted into its corresponding ventricle from this it is sent to the lungs by the pulmonary artery; from the lungs it is transmitted through the pulmonary veins into the posterior auricle thence into the posterior ventricle, and from this last by the medium of the aorta through all portions of the body, with the exception of the lungs.

It is then with this large main trunk of the blood-vessels, that we shall commence our account of their ramifications.

290. Immediately at the commencement of the aorta from the heart, two branches of arteries arise which are distributed upon the heart itself;

These are called the *coronary* arteries; the right coronary artery is the largest of the two; this supplies the anterior portion, the other the posterior portion of the heart. Having sent off these branches, the aorta rises upwards and a little towards the right side, and soon forms a curve or arch, from which three large trunks originate; these are the arteria *innominata* which is the right subclavian and carotid in one trunk, and the left carotid and left subclavian in the other.

291. The *carotid arteries* ascend on each side of the cervical vertebræ, between the internal jugular vein and the trachea, and they divide nearly opposite to the upper margin of the thyroid gland into two great branches; the external and internal: the external branch passing behind the angle of the lower jaw, while the internal one forms a tortuous course before it enters the carotid canal. The branches of the external carotid are the *superior thyroid* the *lingual*, the *pharyngeal*, the *ascending palatine*, the distribution of which may all be known from their names; smaller branches likewise are sent out, which scarcely require to be particularized: the trunk of the carotid then continuing to rise up upon the angle of the maxilla, takes the name of *facial* or *external maxillary;* from this part branches are sent off to the muscles of the face, and the artery anastomeses with branches of the ocular and frontal arteries; a large branch is transmitted to the under lip which anastomeses freely with its fellow on the opposite side; it has been called the *inferior labial*. Then the *coronaries* are sent off which are distributed around the lips, and one to the back of the ear. The *occipital* is a considerable branch from the carotid, which passes across the jugular vein, and subdivides into many branches which ramify upon the middle and back part of the head. There is a branch of this artery called *auricular*, which supplies the lobe of the ear; and another branch passes downwards to be distributed upon the trachilo-mastoid and adjacent muscles.

292. The *temporal* artery is a large branch of the external carotid, which, passing between the maxilla and the meatus auditorius, lies superficially under the skin, and is here called the superficial temporal artery. The deeper-seated branch of the temporal goes behind the condyle, and passes under the aponeurosis of the temporal muscle. The superficial temporal divides, after crossing the zygoma, into anterior and posterior branches; the one supplying the integuments of the fore, the other the back parts of the head. The last great branch of the external carotid has been named the *internal maxillary;* it takes its rise between the condyloid coronoid process of the inferior maxillary bone, and sends off several branches as it ascends towards the back of the antrum; these branches supplying the jaws, the teeth, the antrum, the palate, and the nasal cavities.

293. The *internal carotid*, having passed through the carotid canal, is first directed upwards, then assumes a horizontal direction, and at length perforates the dura mater, sending off small ramifications on this membrane and to the cavernous sinus; the *ocular* or *ophthalmic* artery is a branch of the internal carotid, after it has perforated the dura mater, which ramifies into the orbit of the eye, forming the arterial circle of the iris, and supplying the muscles of the eyeballs, with other parts about the eye and nose. The *anterior arteries* of the *cerebrum*, and the medium arteries, or arteriæ fossæ sylvii, supplying the lobes of the brain, are branches of the internal carotids. These join with large branches of the vertebral arteries, and form, together, the circle of *Willis* on the base of the brain.

Having thus followed the course of the arteries which branch from the aorta to supply the external and internal parts of the head, we now proceed to trace the ramifications to the upper extremities.

294. The right *subclavian* and carotid, generally, as above said, originate from the aorta as one trunk; the left subclavian comes by itself immediately from the aorta. The right trunk, or *arteria innominata*, ascends and crosses over the trachea; about two inches from its origin it divides into the subclavian and carotid. These arteries on each side give off the *internal mammary*, which sends off many smaller branches that ramify down upon the mediastinum, pericardium, intercostal muscles, and even upon the diaphragm; then emerging from the thorax, the mammary anastomeses with the epigastric artery, and now bending downwards between the scaleni muscles, it sends off the *anterior* and *posterior cervical*, which supply the muscles of the neck. Then there is the *dorsalis scapula* for the supply of the dorsum of the scapula and shoulder-joint. The *superior intercostal* principally ramifying upon the first and second ribs, giving branches to the œsophagus and spinal marrow, and anastomosing with the inferior intercostalis; and now the subclavian artery, passing behind the collar-bone and over the first rib into the axilla, takes the name in this situation of *axillary artery*. This, the axillary artery, sends off first the *external mammary* or thoracic, which ramifies upon the breast muscles, the axillary glands, the internal parts of the shoulder-joint, the great deltoid muscle, &c. As the artery (the axillary) passes along the origin of the subscapulary muscle, it gives off the *infra-scapularis;* then the *articularis posterior*, which takes its origin between the subscapularis and teres major muscles; the *circumflexa anterior*, which passes around the anterior part of the cervix of the os humeri; all these branches ramify into other smaller ones, inosculate with each other, and extensively supply the scapula, the shoulder joint, the deltoid, and neighbouring parts.

295. The axillary artery, quitting the axilla, pursues its course along the inner side of the biceps and over the brachialis muscle, here taking the name of *humeral artery*, which transmits the *profunda humeri;* this, passing spirally round the os humeri, appears at the back of the arm, and inosculates with reflected branches from the radial, ulnar, and interosseous arteries. The next considerable branch from the humeral artery is the *profunda minor*, or *inferior*, which takes its rise near the middle of the arm on the outer side, and passes down to supply the parts about the external condyle of the humerus. About an inch below the elbow-joint the humeral artery divides into the *radial* and *ulnar*. The ulnar passing along the ulna bone, first giving off the *recurrens*

to supply the anterior and inner side of the elbow-joint, sends off the *interosseous posterior*, then *anterior*, with other smaller branches, to supply the wrist, and is then continued over the annular ligament to form the superficial palmar arch, from which are given off the three digital branches for the fingers; one is also sent to the thumb, and one called the *ulnaris profunda*, which *anastomoses* with the deeper-seated arch formed by the radial artery. This, the radial artery, passing along the fore part of the radius, lies at the wrist very superficially close on the bone, where the pulse is generally felt, several small branches being transmitted in its course down the arm; a little below the wrist, having passed through the abductor indicis, the artery divides into *magna pollicis*, supplying the inside of the thumb, the *radialis indicis* for the fore-finger, and the *palmaris profunda*, which passes between the roots of the metacarpal bones and flexors of the fingers, to assist in forming the deep-seated *palmar arch*.

(The above is the general course of the subclavian and its branches; occasionally there are found pretty considerable deviations.)

296. We now proceed to trace the *aorta descendens*. From the arch of this vessel, of which we have above spoken, the aorta passes down on the left side of the vertebræ towards the abdomen; before it reaches this cavity it sends off the *bronchial, right and left*, which is principally to supply the inner membrane of the trachea and lungs. The *œsophagæal arteries* either arise directly from the aorta, or are transmitted from the bronchial; they are principally for the gullet, some branches going down to the pericardium. The *superior intercostal* artery is a branch from the thoracic aorta, three large branches of which are lodged in the grooves of the ribs, and the smaller ones supply the spinal marrow and dorsal muscles. The *inferior intercostals* or aortic *intercostals* are eight or ten pair; they rise from the posterior and lateral parts of the aorta, and run in grooves in the under edges of the ribs. These arteries send branches to the spine and intercostal muscles: they likewise anastomose with the external mammary arteries. The *pericardiac arteries*, superior and posterior, sometimes pass off from the thoracic aorta; they sometimes, however, arise from the subclavian and internal mammary arteries. The bronchial and intercostal arteries generally are found to be various in their origins and course.

297. The aorta descending from the chest into the abdomen passes between the tendinous portion of the diaphragm, and is still situated on the left side of the vertebræ. Immediately upon its piercing the diaphragm, two small arteries are sent out for the supply of the diaphragm and the capsules of the kidneys; then there is a large but short artery called the *cæliac*, which very soon subdivides into the *superior gastric*, the *hepatic*, and the *splenic*; the first of which is the smallest, and is distributed principally on the right side of the left extremity of the stomach. The hepatic is the right branch of the cæliac; it passes upwards and forwards behind the pylorus, and near to the cervix of the gall-bladder, divides into the right *gastric* and proper *hepatic*; branches from the first, principally supply the stomach, the pancreas, and the duodenum; and the hepatic before it actually enters the liver gives off the *cystic* branch to the gall-bladder. The splenic artery goes on transversely from the cæliac to the spleen, taking its course along the pancreas, and supplying this organ with several small branches; and there is a pretty considerable branch goes off from the splenic called the *inferior gastric*, which passing along the curvature of the stomach communicates with the right gastric.

298. About a quarter of an inch below the cæliac artery, and behind the pancreas, originates from the aorta the *superior mesenteric* artery, which branches out principally among the layers of the mesentery and the small intestines; the larger branches on the left side being principally destined for the jejunum and ilium; while those on the right side, viz. the *colica dextra*, *media*, and *ileo colic*, are mainly distributed, as their names import.

299. The *inferior mesenteric* artery takes its rise from the aorta considerably lower down, and descends upon the psoas muscle; it gives out a branch, which communicating with the colica media, forms the mesocolic arch. The *hæmorrhoidalis interna* is also from the inferior mesenteric, which is directed towards the sigmoid flexure of the colon and rectum.

300. Between the superior and inferior mesenteric arteries the renal or *emulgent* arteries are sent off from the aorta; these go without any ramifications from them immediately to the kidneys, and are distributed minutely through its substance, as the hepatic artery is through the substance of the liver. Then there are two other long and single arteries from the aorta, viz. the *spermatic*, which are directed down through the abdominal apertures to be minutely dispersed upon the epididymis and testicle.

301. Having sent off these branches, the aorta divides opposite to the third vertebræ of the loins into the two *iliacs*, each of which passes downwards and outwards, and at about the distance of two inches subdivides into the *anterior* and *posterior iliac*.

302. The principal branches of the posterior or internal iliac are posteriorly the *arteria glutæa* passing through the great notch of the os ilium to supply the glutæi muscles; the *sacro laterales* which sometimes take their rise from the gluteal artery; and the *ilio lumbar* or *lesser internal iliac*. The anterior branches are the *umbilical* which in the adult is obliterated or changed into a ligament, except at its commencement. The *obturator*, which, however, is sometimes a branch of the epigastric. The *pudic*. The *ischiatic*. The pudic and some other branches go to the urinary bladder, the lower part of the intestine and the generative organs. The anterior or external iliac goes along the inner edge of the psoas muscle, and passing beneath the crural arch, it then becomes the femoral artery; but before it leaves the pelvis, it sends out the *epigastric* and the *circumflexa* ilii; this general takes its rise about an inch from the crural arch and is there reflected upwards and inwards behind the spermatic chord, and on the inner side of the upper abdominal aperture; the artery the

passes behind the rectus muscle of the abdomen, and meets some of the smaller branches from the internal mammary artery; it sends branches also to supply parts in and about the pelvis. The *circumflexa ilii* is another branch of the external iliac, which arises opposite to the epigastric on the outside, and takes an upward and circuitous course towards the ilium, and among the oblique and transverse muscles of the abdomen.

303. The *femoral artery*, about two inches under the crural arch, divides into two branches, which are nearly equal in size; the one containing, as it were, the trunk of the vessel, retains the name of femoral artery, or superficial femoral; the other, which sinks deep among the muscles, is named the *profunda femoris*. The superficial, or femoral artery, descends obliquely towards the inner side of the thigh, and the sartorious muscle passes across it; while the profunda passes backwards and gives off the two *circumflex arteries*, and four *arteriæ perforantes*. These supply principally the muscles of the thigh.

304. The femoral artery passing on, reaches the back part of the thigh bone and descends into the ham, where it becomes the *popliteal*, and sends out five articular arteries, as they are called, principally for the supply of the knee-joint; the trunk of the artery then is continued through the gastrocnemii muscles, and, opposite to the under edge of the popliteus muscles, divides into two branches, called the *anterior* and *posterior tibial* arteries; the first, passing down the fore part of the leg, goes under the annular ligament, and is distributed to the upper part of the foot; at the root of the first metatarsal bone it passes through to the sole of the foot, communicating with the external plantar artery.

305. The posterior tibial, which follows the course of the tibia to the lower end of the bone, goes round to the bottom of the foot, and divides into the *internal* and *external plantar* arteries; the first of which is placed on the inner side of the sole of the foot; the second, which is the largest of the two, goes between the flexors of the toes till it reaches the metatarsal bone of the little toe.

306. Besides the anterior and posterior tibial there is an artery of the leg called the *fibular*; this passes off from the posterior tibial about an inch below the main division, and running down along the fibula to the foot, communicates with a branch from the anterior tibial called the *malleolar*, and at the foot is lost in what are called the *peroneal* branches.

307. This, which we have above described as the general course of the arteries, supplying the lower extremities, is, like that of the upper extremity, subject to considerable variations.

308. A few words remain to be said on the *pulmonic* system of arterial distribution. Although, indeed, the aorta is the root of all the arteries of the body, and being so we have commenced our account of the arterial system with it; yet, in one sense, the pulmonary artery possesses a prior right to notice, inasmuch as the blood must go through the lungs before it is fitted for the general circulation.

309. The *pulmonary artery*, as we have said, takes its rise from the anterior or right ventricle; it passes upwards behind the sternal bone, and divides very soon into two great branches, one of which is distributed to the right, and the other to the left, lobe of the lungs. The right and left pulmonary arteries are not, however, of exactly the same length or dimensions; the right being longer and larger than the left. The pulmonary artery, as will be more particularly stated in the article physiology, is directed through the lungs for an especial purpose in the animal economy, while the bronchial, and other branches from the aorta already described, seem the proper arteries of the lungs themselves.

310. *Veins.*—As the arterial course has been traced from its commencement at the aorta and pulmonary artery, so may we, in the first place, say generally, that all the returning blood from the lungs is conveyed by the large trunks of the *pulmonary* veins into the anterior auricle, and from the body by the *vena cava, inferior* and *superior*.

311. The return of the blood from the head is in the following manner:—the smaller branches of the veins of the brain unite with the terminations of the arteries; but in the larger branches instead of answering, as in other parts of the system, to the general course of the arteries, pass between the convolutions of the brain, and terminate obliquely in what are called sinuses; which are triangular canals, constituted by doublings of the dura mater, and which are mainly divided into *longitudinal*, *lateral*, and *torcular Herophili*, the first of which takes its rise at the crista galli of the æthmoid bone, runs along the centre of the head, and terminates or divides into the two lateral sinuses, opposite the most prominent portion of the occipital bone; these last follow a tortuous course, and at length terminate in the internal jugular vein. The fourth sinus, or *torcular Herophili*, is a short canal, commencing where the falciform process of the dura mater joins the expansion of it, called the *tentorium*; it passes downwards and backwards, and joins the lateral sinus. The *internal jugular* vein, commencing then from the lateral sinus (and thus receiving blood from the interior of the eye, as well as immediately from the brain), passes down the neck from the foramina lacera, being enclosed in the same sheath with the carotid artery; in its passage it receives blood from veins about the occiput, larynx, pharynx, and tongue, and at length terminates in the subclavian.

312. The blood from the external parts of the head is returned as in other parts from corresponding veins. The external jugular vein, thus at length formed, lies beneath the platysma myoides muscle, passes down the neck and terminates, as well as the external jugular, in the subclavian. This, the *subclavian*, joins with its fellow on the opposite side, opposite to the cartilages of the first ribs, and together form the *vena cava superior*, which as we have already stated, enters the anterior auricle of the heart. But the subclavians are not formed by the cerebral and cervical veins alone; the veins of the superior extremities and the thoracic vessels go to their formation. In the superior extremity there are two sets of veins, the superficial and the deep-

seated. The superficial veins that are seen on the back of the hand, go principally to the superficial radial and ulnar veins; the uppermost or outermost of these, as they take their course along the arm, are called *cephalic*, the innermost the *basilic*, and the middle one the *median*; this last divides below the elbow into the *median cephalic* and *median basilic*, the former going to the cephalic, the latter to the basilic vein. The deep-seated veins accompany the arteries, and joining with those just named form the axillary, which then becoming the subclavian runs along between the clavicle and the first rib.

313. In the inferior extremities there are likewise two sets of veins, the one subcutaneous or superficial, the other deep seated. The two trunks which the former unite are called *saphænæ*; the *saphæna minor*, being situated on the outer side of the ancle, runs up on the back of the leg; the *saphæna major* runs along the inner edge of the tibia, to the inner and upper part of the thigh. The deep-seated veins, like those in the upper extremities, accompany the arteries; and when the femoral vein becomes formed, it ascends and passes under the crural arch, then receiving the name of *anterior iliac*, which joining with the *posterior iliac* constitutes the commencement of the *vena cava inferior*, which at its origin receives the sacral and lumbar veins. This, the vena cava, then ascends through the abdomen and chest, to be inserted, as before observed, into the anterior auricle of the heart.

314. In respect of the abdominal veins there is this peculiarity, that the large trunks of the *mesenteric*, *gastric*, and *splenic*, corresponding with their respective arteries, unite together into one large trunk, which trunk, instead of falling into the vena cava, immediately enters the liver at its *porta*, and hence the vessel is called *vena portæ*; before it reaches the liver it receives likewise the cystic veins; it then divides into two main branches, one supplying the right and the other the left lobe of the organ. The blood that is conveyed to the liver by this channel, as well as that which is carried into it by the hepatic artery, is returned into the cava by veins which are named the *hepatic cavæ*; these open into the cava itself, by two or three trunks, at the part where the vessel passes through the diaphragm.

The veins proper to the chest are the *intercostal*, which correspond in size and direction with the intercostal arteries; then there is beside the *vena azygos*, or *vena sine pari*, which is constituted of the intercostal and bronchial veins, and which enters the cava near its insertion into the auricle. There is a *left* or *smaller vena azygos* which terminates in the left subclavian. The heart itself has a *coronary vein* corresponding with the artery of that name.

The following table has been constructed from Dr. Barclay's work on the Arteries, in which he professes to give more appropriate and scientific appellations, than those in common use, to these vessels.

TABULAR VIEW OF THE PRINCIPAL HUMAN ARTERIES.

No. Names and Synonymes.	*Origin.*	*Distribution.*	*Connection.*
I. Pulmonic Artery. Sy. *Pulmonary Artery.*	From the pulmonic ventricle of the heart.	To the lungs.	Everywhere accompanied by the ramifications of the systemic or pulmonary veins.
II. Systemic Artery. *Aorta.*	From the systemic ventricle.	To every part of the system.	Abdominal portion accompanied by the great pulmonic vein, or vena cava.
III. Cardiac arteries. *Coronary A.*	From the root of the systemic artery.	To the muscular substance of the heart.	Inosculate with each other.
IV. Cephalic arteries. *Common Carotid A.*	From the arched portion of the systemic artery; the left directly from this artery; the right from the common trunk called anonymous.	Rise along the atlantal and lateral parts of the neck, between the wind-pipe and jugular veins, to nearly the atlantal margin of the thyroid cartilage.	Laterad and sternad, with the internal jugular veins; laterad and dorsad with the 8th pair of nerves; dorsad with the great sympathetics; and sternad with the latissimi colli, and other muscles.
V. Pericephalic arteries. *External Carotid A.*	Sternad and mesiad from the preceding.	Crossing the next laterad, atlantad, and dorsad, below the angle of the basilar jaw, and dorsad of the biventer maxillæ and stylohyoideus muscles, towards the parotid gland.	

No. Names and Synonymes.	Origin.	Distribution.	Connection.
VI. Atlanto-thyroid artery. *Superior thyroid A.* Gives off the *Laryngeal artery.*	From the preceding.	Below the omohyoideus and sternothyroideus sacrad, mesiad, and sternad, to the thyroid gland and muscles of the larynx.	Inosculates with the branches of its fellow, and with those of the sacro-thyroid.
VII. Lingual artery Gives off the *Sublingual A.*	Second branch of the Pericephalic.	Commencing beside the pharynx, passes mesiad in a winding course, penetrating the genio-glossus, to the basilar part of the tongue, and adjacent parts.	Inosculates with its fellow.
VIII Pharyngeal artery. *Ascending pharyngeal A.*	From the pericephalic between the pharynx and the rectus capitis internus major muscle.	Ascends to the base of the skull to supply the pharynx and parts adjacent.	
IX. Labial artery. *Facial, angular, or* or *external maxillary A.* Gives off the *Palatine A.* *Submental A.* *Buccal* *Coronary A. of the lips.*	From the pericephalic, with or near the preceding.	Passes atlantad and sternad to the basilar maxilla, which it crosses near the antinial margin of its ramus to the lip and nose	Passes between the zygomatic and buccinator muscles; and inosculates with the nasal branch of the Ophthalmic.
X. Occipital artery.	Behind the biventer maxillæ from the pericephalic.	Runs laterad and dorsad, to the space between the atlas and the mastoid process; thence dorsad and mesiad to the space between the splenii. Supplies the occiput and contiguous parts.	Crosses the internal jugular vein sternad. Inosculates with its fellow, and with branches from the temporal and auricular.
XI. Auricular artery Gives off the *Stylomastoid A.*	From the pericephalic (of which it is the smallest branch) near the extremity of the styloid processs.	Passes through the parotid gland iniad and laterad, to the space between the mastoid process and the root of the auricle.	Inosculates with the occipital and temporal.
XII. Orbito-maxillary artery. *Internal maxillary A.* Gives off the *Geniomaxillary* or *inferior maxillary A.* *Meningial A.* *Buccal A.* &c.	From the pericephalic near the neck of the condyloid process of the basilar maxilla.	Passes mesiad to the spheno-maxillary fissure and the inial part of the orbit; thence antiniad along the maxillary canal, and through the infraorbitary hole. Supplies the teeth and gums, muscles, and other parts in its neighbourhood	Inosculates with the branches from the labial, ophthalmic, and temporal arteries.
XIII. Temporal artery Gives off the *Deep temporal A.* *Transverse of the face.* *Orbicular A.* *Anterior Auricular A.* &c.	Continuation of the pericephalic.	Runs coronad through the parotid gland, across the zygomatic arch, above which it divides into two branches, spreading coronad and iniad, and coronad and glabellad. Supplies the muscles and all the parts in its neighbourhood.	Inosculates with its fellow, and with the occipital, auricular, and ophthalmic.

No. Names and Synonymes.	Origin.	Distribution.	Connection.
XIV. Encephalic artery. *Internal carotid*, or *cerebral A.* Gives off the *Ophthalmic A.* *Communicating A.* *Sylvian A.* &c.	From the cephalic, close to the pericephalic.	Passes through loose cellular substance to the base of the skull, and entering by the carotic hole, through the carotic canal and cavernous sinus, to the optic hole of the sphenoid bone. Contributes with the vertebral artery to supply the Encephalon.	Inosculates with th vertebral artery t form the circle Willis.
XV. Brachial artery. *Subclavian, axillary, and humeral A.* Divided into 1. Subclavian portion, Giving off the *Vertebral A.* *Spinal arteries;* *First intercostal A.* *Sternal* or *internal mammary A.* *Sacro-thyroid A.* 2. Axillary portion, Giving off the *Thoracic arteries;* *Scapular A.* *Circumflex A.* 3. Humeral portion, Giving off the *Deep A. of the humerus.* *Nutritious A. of the humerus.* *Interosseal A.* (generally), &c.	On the right side from the anonymous A., and on the left from the arch of the systemic artery, laterad of the cephalic.	Rises atlantad (more so on the right), bends laterad to the axilla; on approaching the humerus, runs between the biceps and the long head of the triceps, and runs between the tendons of the pectoralis and latissimus dorsi. Generally continues undivided from the axilla to the bend of the elbow, though it may divide into two or three branches at any place within this interval.	Passes dorsad of th Brachial veins, the through a plexus c the great Sympathe tic; in the axilla i surrounded by th nervous plexus, vein and glands, of tha hollow; runs centrac of the fascia of th arm, and ulnad o the biceps muscle.
XVI. Ulnar artery Gives off the *Ulnar recurrent A.* *Nutritious A. of the ulna.*	From the humeral portion of the brachial artery, on the ulnar side of the arm.	Runs between the sublimis, profundus and flexor ulnaris muscles, radiad of the os pisiforme, crosses the carpus radiad, and either forms an arch, or gives out branches in the palm of the hand.	Passes beside the ulna nerve and basil vein. Inosculates in the palm with th radial artery.
XVII. Radial artery Gives off the *Radial recurrent A.* &c.	From the humeral portion of the brachial artery, on the radial side of the arm.	Runs thenad and more peripherad than the preceding, between the supinator radii longus and flexor radialis, resting on the flexor longus pollicis till it reaces the carpus, when it passes anconad to the back of the hand.	Inosculates with th branches of the pre ceding.
XVIII. Bronchial arteries.	From the thoracic portion of the systemic artery.	To the bronchi of the lungs.	Inosculate with twig from the pulmon artery.
XIX. Phrenic arteries.	Generally from the abdominal portion of the systemic artery, sometimes from the cœliac.	To the concave surface of the diaphragm and neighbouring organs.	Inosculate with the ste nal and intercost arteries.

No. Names and Synonymes.	Origin.	Distribution.	Connection.
XX. Cœliac artery.	From the abdominal portion of the systemic A.	Common trunk or root of the three succeeding.	
XXI. Gastric arteries.	Generally from the cœliac.	To the concave arch of the stomach, the cardia, and the pylorus.	Inosculate with the vaie brevia, from the splenic and neighbouring arteries.
XXII. Hepatic artery Gives off the *Right gastro-epiploic A.*	In most cases from the cœliac.	Entering by the fossa of the vena portæ, supplies the substance of the liver and some of the neighbouring parts.	
XXIII. Splenic artery Gives off the *Left gastro epiploic A. vasa brevia*, &c.	From the cœliac.	To the spleen and neighbouring parts.	Inosculate with the gastric arteries.
XXIV. Greater mesenteric artery. *Superior mesenteric A.*	From the abdominal portion of the systemic artery sternad, and sacrad of the cœliac.	To the small intestines, the cœcum, and right colon.	Communicates with branches from the cœliac.
XXV. Lesser mesenteric artery. *Inferior mesenteric.*	From the sternal side of the abdominal systemic artery sacrad of the preceding.	To the left colon and rectum.	Inosculates with the branches from the adjacent arteries.
XXVI. Renal arteries. *Emulgent A.*	From the sterno-lateral parts of the abdominal systemic A. sacrad of the preceding.	To the kidneys chiefly.	
XXVII. Spermatic arteries.	Generally from the abdominal systemic artery on its sternal aspect, near the preceding.	To the testes.	Cross the epigastric arteries sternad.
XXVIII. Lumbar arteries.	From the lateral parts of the abdominal systemic A.	To the parietes of the abdomen.	Inosculate with the neighbouring arteries.
XXIX. Sacro-median artery.	Sternad from the bifurcated termination of the abdominal systemic artery.	Runs mesiad and sacrad to the coccyx, supplying the sacrum.	
XXX. Crural arteries. *Common iliac A.* Divided into	Terminate the abdominal systemic artery.	Pass sacrad and laterad, the left keeping on the left side of the crural vein, while the right crosses the great pulmonic vein (vena cava).	
1. Lumbar portion, including the *Hypo-iliac* or *hypogastric A.* Giving off the *Gluteal A.* *Ischiatic A.* *Ilio-lumbar A.* *Sacro-lateral.* *Uterine A.* *Vesical A.* *Hæmorrhoidal A.* *Pudic A.*	The hypo-iliac arises at the junction of the sacrum with the ilium.	The hypo-iliac strikes into the pelvis to supply the urinary and genital organs, with the musles and ligaments of the pelvis.	
2. Iliac portion, or *External iliac A.* Giving off *Epigastric A.* *Circumflex A.*	The iliac portion extends from the junction of the ilium and sacrum to Poupart's ligament.	The iliac portion runs mesiad of the psoæ muscles and laterad of the crural vein, giving off few branches till it reaches the ligament.	The iliac portion has the crural nerve laterad.

No.	Names and Synonymes.	Origin.	Distribution.	Connection.
3	Inguinal portion, or *Common Femoral artery*, Giving off the *Circumflex A. of the femur.* *Deep A. of the femur.*	The inguinal portion extends from Poupart's ligament to the groin.	The inguinal portion runs centrad of the fascia and inguinal glands, mesiad of the crural nerve and iliacus internus muscle, and laterad of the crural vein and pectineus.	The branches from the crural arteries inosculate freely with each other.
4.	Femoro-tibial portion, or *Superficial femoral A.*, Giving off the *Perforant A* *Anastomatic A.*	The femoro-tibial portion extends from the groin to the tendon of the adductor magnus muscle.	The femoro-tibial portions runs poplitead behind the fascia, the sortorius muscle, and the aponeurosis, passing from the vastus internus to the adductor magnus.	
5.	Femoro-popliteal portion, or *popliteal artery*, Giving off the *Articular arteries;* *Gastrocnemial A.* *Tibial A.* *Peroneal A.* *Plantar A.*	The femoro-popliteal portion commences at the above tendon.	The last portion runs distad and fibulad, then distad between the condyles of the femur, peripherad of the capsular ligament and popliteus muscle, and centrad of the gastrocnemius externus muscle, dividing into two tibials, the one running rotulad, the other poplitead to the foot.	

Lymphatic and Lacteal Absorbents.

316. The general termination of these vessels is into the Thoracic Duct; for an account of their immediate origin, see the first part of the present article. They are much more numerous than the blood-vessels, and they communicate frequently and freely with each other. In their progress they are connected with the *glands* before described; like the veins they are *superficial* and *deep-seated*. The first consists of very numerous vessels, which lie between the skin and the cellular membrane, and the muscles under the skin; while the second set accompanies the arteries and supply all the internal parts by extensive and minute ramifications.

317. In commencing our account of the lymphatics from the lower extremities, we may state that a very great number of the superficial lymphatics accompany the greater *saphna* vein. They may be first traced from the toes, where they run somewhat like arteries and veins, they form a plexus over the toes, from which branches are transmitted over the top of the foot to the inner part of the leg; another set on the outer side of the foot cross over the front of the tibia, and enter what are called popliteal glands, which are situated round the popliteal artery; on the inner side of the thigh a large number of these vessels are found, which lead to the lymphatic glands of the groin, some passing on without entering these glands. The deeper-seated lymphatics of the lower extremities first accompany the plantar arteries, and run up the leg by the sides of the posterior tibial artery; other, but less numerous branches, accompany the tibial and fibulian arteries; these lymphatics are first connected with the popliteal glands, from which three or four large branches peep upwards along the femoral artery to become connected with the inguinal glands. These glands likewise receive the lymphatics from the sciotum, the penis, the glutei muscles; and into the upper series of them many lymphatics also enter from the superficial parts of the abdomen and pelvis.

318. The lymphatic vessels of the upper extremity scarcely need to be described, as they for the most part in their course accompany the veins, where they are superficial, and the arteries when deep-seated. Some of them pass into small glands in the vicinity of the puminal artery, but for the most part they do not enter any glands until they reach the axilla; some pass on between the pectoral and deltoid muscles to be inserted into glands at the under part of the clavicle. Into the axiliary and clavicle glands,

pass also the greater number of lymphatics from the sides of the thorax, and from the mammæ. From these glands, (the axillary,) large lymphatic vessels pass out, and by their union form a trunk, which on the left side of the body leads to the thoracic duct near to its termination. On the right side, the trunk thus formed by the lymphatic vessels, principally of the upper extremity, joins with the large lymphatic trunk, called the trunk of *steno*.

319. The *Thoracic duct*.—This is formed by the lymphatic vessels of the lower extremity, and by the trunk formed from the lacteal vessels. It first appears in the form of a sac, called the *receptacle of the chyle*, which is a bag of a pyriform shape, placed on the first or second vertebra of the loins; it is about two-thirds of an inch in length; towards its upper part it gradually contracts, and at length forms the tube which is properly the duct; this is not above a line in diameter; it passes up from the sac close to the spine, at first behind the aorta; it then perforates the diaphragm, and is found on the right side of the aorta, passing on between that vessel and the vena-azygos, and at length terminating at the junction of the internal jugular and subclavian veins of the left side of the body.

320. The *lacteal vessels*, like the lymphatics, are found in two sets, which communicate with each other. They take their rise from the villi of the intestines, pass obliquely through their coats, uniting, as they pass out, so as to form larger and larger branches. From the intestines they run along the mesentery towards the spine; passing through glands on the mesentery, and at length uniting, they form two or three trunks which accompany the superior mesenteric artery, till they reach the right side of the aorta, and here they terminate in the thoracic duct. The lacteals of the small intestines are more numerous than those of the larger. Their course likewise, and termination, are somewhat different; some from the latter accompany the inferior mesenteric artery, and communicate with the large lymphatic vessels near its root.

321. It now remains for us to trace the *thoracic* and *abdominal lymphatics*. In the lungs there are two sets also of lymphatics, the superficial and the deep-seated. The former running chiefly between the lobules, some passing over them, and all going to the *bronchial glands*, where they are joined by the deep-seated lymphatics, that go along the branches of the trachea and the pulmonary artery. Having passed through these glands, the principal part of those from the left lung forms a trunk which terminates in the thoracic duct, behind the division of the trachea; then there are other lymphatics of the left lobe which pass through glands behind the arch of the aorta, and which are likewise common to those of the heart, the lymphatics of which organ accompany the carotid arteries. These last vessels are much smaller than those of the lungs. The absorbents of the right lung, after leaving the bronchial glands, form three or four principal trunks, one of which commonly ascends on to the fore part of the vena cava superior, and opens into the duct of steno that terminates in the veins on the right side of the neck.

322. In describing the abdominal lymphatics we shall trace them from the termination of those from the inferior extremities; these having reached the trunk of the body, and passed under Poupart's ligament appear upon the sides of the pubic bones near the pelvis. A part of them passes up along with the iliac artery upon the brim of the pelvis; and another dips down into the pelvic cavity joining the internal iliac artery, near the sciatic notch. At this place they are joined by the lymphatics of the *pelvic viscera*, particularly of the *bladder*, and *vesiculæ seminales* of the male, and from the *uterus* in the female; and there are likewise several branches which pass through the sciatic notch from the neighbourhood of the glutœi muscles, branches before referred to.

323. On the outside of the iliac artery upon the psoas muscle several considerable branches of lymphatics likewise pass; of these, one part passes up to the loins, and goes under the aorta in different branches, getting from the left to the right side and joining the thoracic duct; and another passes under the iliac arteries, and appears upon the sacral bone. The lymphatic vessels from either side, having in part joined upon the right lumbar region form here a large plexus, and pass through several glands; into this plexus large branches are received from the left plexus; and having at length got up as high as the second vertebra of the loins, the junction here of the lymphatics and the lacteals constitutes the thoracic duct, before described.

324. All the abdominal viscera have both superficial and deep-seated lymphatics; the *stomach* has two sets, the one running upon its lesser, and the other upon its greater, curvature. Of these the former accompanies the coronary artery, and passes through some glands which lie by its sides. The other set passes from the great curvature of the stomach, partly to the left and partly to the right side. Those on the left side receive the lymphatics of the first half of the great omentum, and pass through some lymphatic glands which lie close upon the right gastric artery, and near the lesser curvature of the duodenum, form a considerable plexus. Into this plexus the lymphatics from the *spleen* enter, as also those from the *gall-bladder*, and the deeper-seated lymphatics of the *liver*; and from it several branches proceed, which open into the thoracic duct, near the termination of the large trunk of the lacteals; this duct, we have said, being thus the common receptacle of the absorbent and lacteal vessels. The lymphatics of the liver lie, the one set upon the surface of the organ, and the other by the branches of large blood-vessels in its centre; they however communicate with each other very freely. Most of the lymphatics that lie upon the convex surface of the liver, run towards its falciform ligament, and pass through the diaphragm into the glands, which are situated on the anterior part of the pericardium. Others of them run towards the lateral ligaments of the liver, where they pass through the diapraghm, and afterwards run on its upper surface to unite with those from the ligamentum latum. There is however here, as elsewhere, considerable variety in the course and dis-

tribution of these vessels. From the glands on the anterior part of the pericardium just mentioned, a large trunk ascends behind the sternum in the anterior mediastinum, and usually joins the thoracic duct near its termination. Sometimes there are two trunks or more on each side of the chest; those on the left side ending in the thoracic duct, those on the right going into the lymphatic trunk on that side of the neck. The lymphatics on the concave surface of the liver, run towards the porta of the organ; having joined those from the centre of the liver, they pass into glands on the vena portæ; and afterwards end in the thoracic duct, near the root of the superior mesenteric artery. The lymphatics of the *kidney* run from its outer towards its inner edge, and pass through the lumbar glands. Into the plexus of lymphatics belonging to the kidneys, the lymphatics also of the *glandulæ renales* enter. The lymphatic vessels of the kidneys are very small in their natural state, and scarcely visible excepting under circumstances of disease. The lymphatic vessels of the *spleen* pass from the concave side of that viscus, and join branches which run along the sinuosity of the *pancreas*.

325. The *Lymphatic glands*, it will be inferred from the above description of the vessels to which they are attached, are much more numerous in some than in other parts. They especially abound in the axilla, in the groin, at the sides of the neck, and at the great division of the aorta into the two iliac vessels.

Brain and Nerves.

326. For an account of the general structure and composition of these organs, we refer our readers to the commencement of this article. The brain, properly so called, occupies all the upper part of the cavity of the skull, and in its form or figure corresponds with the form of the cranium. It is divided into two portions, called *hemispheres*, each of which is again subdivided into lobes which are three in number, the anterior one resting upon the orbitar process of the frontal bone, the middle occupying the cavity formed by the sphenoid and temporal bones, and the posterior resting upon that expanse of the dura mater which is called the *tentorium cerebelli*. The division of the brain into two hemispheres only goes down to a certain extent; it is effected by what is called the *falciform process* of the dura mater, and if, according to the common mode of demonstrating the brain, the two hemispheres are sliced off and removed, the flattened surface presenting itself, or the white portion of it, is named *centrum ovale*; but first, upon taking out the dividing membrane from between the hemispheres, a broad white plate uniting these hemispheres is perceived; this is named the *corpus callosum*, along which a groove passes longitudinally, transmitting transverse fibres. Under the corpus callosum the *lateral ventricles* are situated, which are divided into right and left by an exceedingly thin membrane named *septum lucidum*: this membrane is placed between the corpus callosum and the *fornix*, which last is formed by a sort of continuation of the posterior bend of the corpus callosum: it has a division into four parts, called *crura*; the under surface of the fornix is impressed by a number of grooves, so disposed as to resemble in some measure the strings of a lyre. When it is removed the *lateral ventricles* of the brain are fully exposed to view, and the following parts now come into view: the *corpora striata*, which are two prominences of a striated appearance, from being composed partly of white and partly of brown matter; and the two *thalami nervorum opticorum*, which intervene between the posterior parts of the corpora striata; these bodies are united by what is called the *commissura mollis* from its soft texture and medullary appearance. In each lateral ventricle there is likewise found lying upon the thalami a congeries of vessels called *plexus choroides*, which are stretched over the *pineal gland* and the *corpora quadrigemina*: these last, which are likewise called *nates and testes*, come into view upon removing the plexus at the back part of what is named the *third ventricle*; the other body (the pineal gland) is placed over the nates. The third ventricle is a deep fissure situated under the commissura mollis, and from it the funnel-like cavity called *infundibulum* runs forward towards the *pituitary gland*, which is a small oblong-shaped substance situated upon the sphenoidal bone. Under the anterior part of the body of the fornix, and over the fore part of the third ventricle, the lateral ventricles communicate with each other by a small oval foramen. In what are called the descending cornua of the ventricles, there are two rounded bodies which are joined to the posterior extremity of the corpus callorum; these are named *pedes hippocampi*. The sharp point at the extremity of each of the posterior cornua of the lateral ventricle is called *ergot*.

327. The *cerebellum*, or smaller brain, occupies the inferior cavities of the occipital bone, and is found covered by the tentorium, under the posterior lobes of the proper or large brain. Like the brain itself, the cerebellum is divided into two great lobes or hemispheres, each being subdivided into lobules; a vertical section of this part discovers the *fourth ventricle*, which extends from the testes on to the back part of the cerebellum; at the under part of this (the fourth ventricle) an angular impression is found, which is called *calamus scriptorius*. The cerebellum is joined to the cerebrum by chords which are inserted into the substance of the cerebellum, and the fibres of which are described as being intermixed with those of the *medulla oblongata*.

328. This (the medulla oblongata) is a combination of the cerebrum and cerebellum; it is of a conical shape, with its base next to the brain and it is extended on as far as the large foramen of the occipital bone, when it takes the name of *spinal chord*, or *medulla spinalis*. It is on the under surface of the brain that the medulla oblongata is placed, and can therefore only be seen by inverting the whole mass. There are four *crura* or processes from the cerebrum and the cerebellum, which first form by their junction the *tuber annulare* or *pons varolii*; and the medulla oblongata is the cone-like substance between this and the spinal chord.

329. The spinal chord then, or, as it is

arly called, *spinal marrow*, is continued from the medulla oblongata through the foramen magnum occipitalis down the cavity of the spine; it is covered by the same membranes as the brain; is likewise composed, like the brain, of brown and white matter. It has been divided into cervical, dorsal, and lumbar portions, where there are enlargements for the lateral transmission of nerves as we shall immediately see; and its lower extremity is expanded out into several filaments, which, together, are called *cauda equina*. It is necessary to say, that each nerve derived from the spinal marrow, as it is transmitted, consists of an anterior and posterior bundle of fibres, and that in the posterior bundle, as distinct from the anterior, a ganglion is found.

330. Having thus given a general description of the brain and spinal chord; or, as some speak, the *cranial* and *spinal* brain, we now proceed to trace the nervous ramifications; and in so doing we shall pursue the ordinary method of anatomists, reserving for the article PHYSIOLOGY the discussion of the questions that have recently been agitated respecting the mode in which they actually originate, or are connected with the brain and spine, and with each other; as likewise the combined and separate purposes they serve in the animal economy.

331. The nerves, then, have been divided into two main classes, viz. the *cerebral* and *spinal nerves*, or those from the brain directly, and those from the spinal chord; the first set are principally from the basis of the brain, or medulla oblongata; of these there are nine, or, according to some, ten pairs; the tenth being, or being not considered a nerve of the spine.

332. The *first* pair, or *olfactory* nerves, take their rise from the corpora striata, and running under the anterior lobes of the brain approach each other as they pass forwards, and are at length ramified upon the turbinated processes of the ethmoid bone, and upon the septum narium.

333. The *second* or *optic* arise, according to some, from the thalami nervorum opticorum, according to others from the nates and testes; they form a junction at the sella turcica, and afterwards dividing, pass out at their proper orifice in the sphenoid bone to be expanded upon the retina of the eye.

334. The *third*, or *motores oculorum*, are traced from the inferior part of the crura cerebri; they pass out at the foramen lacerum, and are distributed upon most of the muscles of the eye.

335. The *fourth pair* arise from over the passage to the fourth ventricle; they likewise pass on through the foramen lacerum, and are spent upon the larger oblique muscle of the eye.

336. The *fifth pair*, or *trigemini*, arise by the side of the tuber annulare; and, having perforated the dura mater, divide into three great branches; the *ophthalmic* or *orbitar*, the *maxillaris superior*, and the *maxillaris inferior*.

337. The ophthalmic branch, as it passes through the foramen lacerum, and is about to enter the orbit, transmits a small branch which assists in the formation of the great intercostal; it then passes on to the lachrymal gland and parts about the eye, sending off one considerable branch to the membrane of the nose and integuments of the forehead.

338. The superior maxillary branch passes through the large round foramen of the sphenoid bone, and gives nerves to the palate, sphenoidal sinus, and nostrils; the trunk of the nerve passes through at the top of the antrum, gives branches to the teeth of the upper jaw, and is at length spent upon the orbicularis palpebrarum muscle, the nose, and upper lip; here it is that the branches of this nerve seem to unite with those of the seventh.

339. The inferior maxillary branch passes out at the foramen ovale and is distributed, as its name implies; but besides sending branches to the muscles about the lower jaw, and to the salivary glands, it likewise supplies the external ear, uniting with the portio dura of the eighth pair, and likewise with the ninth pair.

340. The *sixth pair*, or *abducentes*, arise from the tuber annulare; they pass within the cavernous sinuses, and then through the foramen lacerum to the abductor muscle of the eye; a branch from this nerve, joining with the ophthalmic branch of the fifth pair, is described as forming the origin of the *intercostal*.

341. The *seventh pair*, or *auditory*, arising by the side of the tuber annulare, goes into the meatus auditorius internus, one part loses its firm coat, and is ramified upon the internal parts of the organ of hearing; this is the *portio mollis* of anatomists; the other, the *portio dura*, goes through the canal of Fallopius, and comes out of the skull with its investments, supplying the muscles about the pharynx and neck, and communicating with the maxillary branches of the fifth pair.

342. The *eighth pair* arise from the medulla oblongata, and consist on each side of the *par vagum* and *glosso-pharyngeus*, both of which pass out from the skull at the foramen common to the temporal and occipital bones; a branch from the glosso-pharyngeal nerve joins with the digastric branch of the portio dura; branches likewise are given off from the glosso-pharyngeus, which, uniting with the pharyngeal branches of the other division of the nerve, form the plexus, which lies over the internal carotid artery, and from which nerves go to the heart. The glosso-pharyngeal then supplies the tonsil, the upper part of the pharynx, the epiglottis, and the root of the tongue.

343. The par vagum runs straight down the neck, near the carotid artery and jugular vein, in its course giving off several branches to the pharynx and larynx. When it has entered the thorax it splits into two portions, the anterior of which supplies the pericardium, sends branches to join with those of the intercostal that go to the heart, and then it takes a winding and retrogade course, on the right side turning round the subclavian, and on the left the ductus arteriosus; it then again mounts upwards on the side of the œsophagus to be lost in the larynx. This is called the *recurrent nerve*. The other branch of the right pair goes to the supply of the œsophagus, the lungs, and the stomach, and joins the intercostal immediately below the diaphragm.

344. The *ninth pair* appear first at the lower part of the corpora pyramidalia, they pass out through the superior condyloid foramina; the nerves of the opposite side are conjoined with the suboccipital nerve by a cross branch; it then

descends down the neck and transmits a branch called the *descendens noni*, the trunk of the nerve then passing upon the hyoglossus muscle divides into branches which join the lingual branch of the fifth pair, to be lost in the substance of the tongue.

345. The *tenth pair*, considered by some as the first of the cervical nerves, take their rise from the very beginning of the spinal chord, and their branches are expanded upon the oblique and extensor muscles of the head.

346. Before describing the spinal nerves and their branches, it will be right to trace the ramifications of the *intercostal*, which together with the par vagum of the eighth pair constitutes the *great sympathetic nerve* of anatomists. We have already said that the ophthalmic branch of the fifth pair transmits a small branch which assists in the formation of the great intercostal, and that this is joined by a branch from the sixth pair subservient to the same purpose; these, when they have left the petrous bone, are joined by branches from the eighth, ninth, and tenth pairs, as well as with the first and second of the spinal nerves; these together form a very large ganglion, from which the nerve, now first named intercostal, goes out, and descends down the neck with the carotid artery, supplying in its course the flexor muscles of the head and neck, and communicating with the cervical nerves. As it is about to enter the thorax, another ganglion or plexus is found which supply the trachea and the heart, joining, as we have before intimated, with branches of the eighth pair, to furnish these cardiac nerves. Then the main nerve runs down on the side of the vertebræ, receiving everywhere additional branches from the spinal chord till it passes through the diaphragm, and a large bundle or ganglion is formed close by the glandulæ renales, into which the eighth pair enters. From a similar ganglion on each side the nerves of the intestines, liver, spleen, pancreas, and kidneys are derived; and the extremity of the nerve itself is sent down into the pelvis, supplying the parts and organs contained in that cavity.

347. We now proceed to trace the *spinal nerves*. These have been divided into four orders, viz. seven of the neck or the *cervical nerves;* twelve of the back or *dorsal nerves;* five of the *loins* or *lumbar nerves;* and six of the os sacrum or *sacral nerves:* making in all *thirty pairs*. We have already said, and it is important to observe, that each nerve transmitted from the spine, consists of an anterior and posterior bundle of fibres.

348. The *first cervical nerve* passes out from between the first and second vertebræ; and after sending off branches, which communicate with the tenth and second vertebral is spent upon some of the muscles of the neck, and on the occipital integuments.

249. The *second cervical* communicates with the ninth from the brain, and with the first and third of the neck; it likewise joins by branches the portio dura of the seventh pair, and partly supplies the parotid gland and external ear.

350. The *third cervical* is transmitted from between the third and fourth vertebræ, soon communicating with the second, and sending down a large branch, which, being joined by another from the fourth, constitutes the *phrenic* nerve, which runs along the pericardium, and is spent upon the diaphragm. Its other branches are transmitted to the integuments and muscles of the shoulder

351. The *fourth cervical*, after sending off branches to help in the formation of the phrenic, runs straight to the axilla, where it meets with the fifth, sixth, and seventh cervicals, and with the first dorsal; all these sink into the interstices of the scaleni muscles; and all of them are so often conjoined and blended after they have given off nerves to the muscles of the neck, shoulder, arms, and chest, and to the integuments, that when the several ramifications go off in the axilla to the different parts of the superior extremity, it is impossible to determine which of them the branches belong to. The considerable branches into which they have been divided are six; and to each of these distinguishing names have been given, viz.

352. The *cutaneus*, which runs down the fore part of the arms, and supplies the integuments as far as the palm of the hand and fingers.

353. The *perforans casserii*, or musculo cutaneous, which passes through the coracobrachialis muscle; and, after supplying the biceps and the brachialis internus, is spent upon the wrist and back of the hand.

354. The *ulnar*.—This nerve runs along the ulna, after supplying the extensors of the arm and integuments of the elbow, and is at length lost in the back of the hand, among the interosseous muscles, and the little and ring finger.

355. The *radial* or *median* goes down the fore part of the arm along the radius, giving branches as it passes to the neighbouring muscles; then, dividing at the annular ligament of the wrist, it is spent upon the back of the hand, and upon the thumb, fore finger, middle finger, and one half of the ring finger.

356. The *muscularis*.—This runs down the fore part of the arm to be lost in the flexors of the wrist and fingers.

357. The *articular*, which runs almost round the top of the os humeri, and supplies the extensors and retractors of the arm, and elevators of the humerus.

358. To these may be added, the *subscapular* which gives nerves to the muscles of the scapula descending upon the fore part of the spine of the bone, it is lost among the muscles that lie upon its dorsum.

359. The *twelve dorsal nerves* of each side as soon as they escape from between the vertebræ send a branch forward to join them all; and they soon likewise give branches backwards to the muscles that raise the trunk of the body, the principal trunk being extended outwards to come at the furrow in the lower edge of each rib, which they run towards the anterior part of the chest, between the internal and external intercostal muscles, giving off branches in their course to the muscles and ligaments of the thorax.

360. The *first dorsal*, it has already been said contributes to form the brachial nerves; and it is further particular in this circumstance that it

two branches of the intercostal which come down to the thorax form a considerable ganglion with it.

361. The *six lower dorsal* nerves give branches to the diaphragm and abdominal muscles.

362. The *twelfth* joins with the first lumbar, and gives nerves to the musculus quadratus lumborum, and iliacus internus.

363. The *five lumbar nerves* on each side communicate with the intercostal, and with each other, and give branches backward to the loins.

364. The *first* communicates with the last dorsal, sends branches to the abdominal muscles, to the psoas iliacus, and to the anterior parts of the thigh, while its principal branch joins with the other nerves to form the crural nerve.

365. The *second* passes through the psoas muscle, and is distributed nearly in the same manner as the former; as is likewise the third.

366. Branches of the second, third, and fourth, make up one trunk, which runs along the fore part of the pelvis, and passing through the notch at the anterior part of the foramen magnum, ischii, and pubis, goes to the triceps, and to the teguments on the inside of the thigh. This nerve is commonly called the *obturator* or *posterior crural*.

367. By uniting branches from the *first*, *second*, *third*, and *fourth* lumbar nerves, the *anterior crural nerve* is formed, which, running along the psoas muscle, escapes from the abdomen along with the external iliac vessels, below the tendinous arch of the external oblique muscles. This nerve is distributed principally to the muscles and teguments on the fore part of the thigh. One branch, however, runs down the leg to the upper part of the foot, keeping near the saphena vein.

368. The remainder of the third and fourth lumbar join with the *fifth* to help in the constitution of the largest nerve of the body, viz. the *sciatic* or *ischiatic*; which is further composed of the *first*, *second*, and *third of the sacral nerves*: this nerve, after sending large branches to the different parts of the pelvis, and to the external parts of generation, as likewise to the muscles of the hips, passes behind the greater tuber of the os ischium, and then over the quadrigemini muscles, to run down near to the bone of the thigh at its back part, giving off nerves to the neighbouring muscles and teguments some way above the ham, where it has the name of popliteal nerve; it here divides into two or sends off a large branch, which passes over the fibula, and, sinking among the muscles on the fore and outer part of the leg, runs down to the foot to be distributed about the upper part of the toes, supplying in its course the neighbouring muscles and teguments. The main branch, after giving nerves to the muscles and teguments above the ham and knee, and sending a large cutaneous nerve down the calf of the leg to supply the outside of the foot, sinks below the gemellus muscle, and distributes nerves to the muscles on the back of the leg; continuing its course it passes behind the internal malleolus, and in the internal hollow of the os calcis it divides into the plantar nerves, external and internal; the internal being sent to the toes in the same manner as the radialis in the hand; while the external, like the ulnaris of the hand to the palm and concave surface of the fingers, is distributed upon the sole of the foot and outer part of the toes.

369. The *fourth* sacral nerve is much smaller than the three just described; this is soon lost upon the urinary bladder and rectum.

370. The *fifth*, which is likewise as small, is distributed mainly to the levatores ani.

371. These sacral nerves, together with the *sixth* and last, all proceed from what has been called the *Cauda Equina*, or, indeed, the nervous branches constitute the cauda.

372. In the instance of the muscles and the arteries it will have been observed, that, after tracing and naming them according to the ordinary method and nomenclature, we have given concentrated views of proposed improvements in reference to these particulars. With respect to the nerves, as some views that have lately been taken of them refer rather to their functions than their distribution, we shall consider this proposed reformation in the article PHYSIOLOGY.

Dr. Gordon's tabular distribution of the nerves we however subjoin.

'There are eight pairs of cerebral nerves:—

The olfactory.
The optic.
The common oculo-muscular, motores communes oculorum.
The internal oculo-muscular nerves, the fourth pair according to the old enumeration, nervi pathetici
The external oculo-muscular, abductores oculorum.
The trigeminal, the fifth pair according to the old enumeration.
The facial, the portio dura of the seventh pair according to the old enumeration.
The auditory, the portio mollis of the seventh pair.

There are thirty-four pairs of spinal nerves:—

The glosso pharyngeal.
The pneumo-gastric, the eighth pair of the central nerves according to the old enumeration. Par vagum. Nervi vagi.
The hypo-glossal.
The accessory.
The suboccipital.
The cervical, seven pairs.
The dorsal, twelve pairs.
The lumbar, five pairs.
The sacral, five pairs.

'We have purposely,' says our author, 'avoided applying any numerical appellations to the primary nerves, which arise from the brain and the top of the spinal chord, in order that there might be the less risk of their being mistaken by those who have been long accustomed to the old but very inaccurate numerical nomenclature.'

373. It is usual to append to treatises on anatomy, directions for inspecting the various parts and organs of the body after death; but these directions, we think, will be more appropriately introduced under the head of SURGERY, to which, therefore, we refer our readers.

374. In recommending the best books for the anatomical student to consult, we cannot but

lament that this country is deficient in respect of a full systematic treatise on the science of anatomy, which shall meet every want of the pupil; the systems of anatomy, however, published by Charles Bell, and that more lately presented to the world by the third Dr. Monro, have both sufficient merit to entitle them to a place in the anatomical student's library. We are also not wanting in exceedingly good manuals for the guidance of the dissector. Shaw's, Green's, and Stanley's Compendia, are all of them meritorious productions, and one or other of them it behoves the pupil to possess. Fyfe's anatomy in three large volumes with plates, has long enjoyed a considerable reputation; but the graphical part is not nearly so well executed as ought to have been the case in a work of this magnitude. The abridgment of this work, by its author, in three small thin volumes, constitutes an exceedingly useful manual for the student; indeed we know not of any production which contains so much in so small a compass. For the combination of elegance and fidelity in anatomical delineation, recourse must be had to Mr. Charles Bell's separate illustrations of the blood-vessels, the nerves, &c. This last author, indeed, possesses a delicacy of pencil which has scarcely ever been equalled. For accurate delineations of the brain, the larger work of Gall and Spurzheim may be consulted with the greatest satisfaction and advantage; and at this moment a series of anatomical plates is in the progress of publication, by Lizars of Edinburgh, which, when finished, will perhaps be superior in their totality to any thing that has hitherto appeared in Britain.

375. With respect to accredited works of less recent standing, and not confined to our own country, we may mention from among many others the large folio books of Cheselden and Albinus on the bones; the latter author's fine work on the muscles; and an elegant volume from Cowper on the same subject Haller's folio work on the blood-vessels; and the second Monro's account of the nervous system. Soemmering on the brain is a work also of considerable merit; and Hunter's delineations and description of the gravid uterus is a masterly performance.

376. A small work has lately been published by Mr. Turner, entitled Medico Chirurgical Education, the object of which is to give the anatomical student a better notion of the *connected* and *relative* situation of parts, than treatises in the abstract can afford. The idea is a good one, and, as far as it has been carried out by the author, the plan is judiciously pursued We think, however, that he would do well to extend the design, and be somewhat more particular in the execution of its several parts.

EXPLANATION OF PLATE I.

Front view of the Skeleton.—1. Cranium. 2. Cervical vertebræ. 3. Clavicles. 4. Acromions. 6. Humerus. 7. Radius. 8. Ulna. 9. Carpus. 10. Metacarpus. 11, 12. Sternum. 13. Ribs. 14. Lumbar vertebræ. 15. Os sacrum. 16. Ossa innominata. 17. Ossa ilia. 18. Ossa pubis. 19. Ossa ischia. 20. Os femoris. 21. Patella. 22. Tibia. 23. Fibula. 26. Os calcis. 27. Tarsus. 28. Metatarsus. 29. Phalanges of the toes.

EXPLANATION OF PLATE II.

Back View of the Skeleton.—1. Cranium 2. Os occipites. 3. Cervical vertebræ. 4. Scapula. 5. Clavicles. 6. Dorsal vertebræ. 7 Lumbar vertebræ. 8. Humerus. 9. Radius. 10. Ulna. 11. Olecranon. 12. Carpus. 13. Metacarpus. 17. Ossa innominata. 19. Os sacrum. 20. Great trochanter. 21. Femur. 22. Tibia. 23. Fibula. 24. Os calcis. 25. Phalanges of the toes.

EXPLANATION OF PLATE III.

Front view of the Outermost Muscles viewed anteriorly.—*a*, Platysma myoides. *b*, Deltoides. *c*, Biceps brachii. *d*, Pronator radii teres. *e*, Supinator radii longus. *f*, Flexor carpi radialis. *g*, Palmaris longus. *h*, Flexor carpi ulnaris. *i*, Pectoralis major. *k*, Obliquus descendens externus. *l*, Linea Semilunaris. *m*, Linea Alba. *n*, Poupart's ligament. *o*, Sartorius. *p*, Tensor vaginæ femoris. *q*, Gracilis. *r*, Iliacus internus. *s*, Pectinalis. *t*, Triceps adductor femoris. *u*, Psoas magnus. *v*, Vastus externus. *w*, Vastus internus. *x*. Rectus.

EXPLANATION OF PLATE IV.

Back View of Superficial Muscles.—*a*, Trapezius. *b*, Latissimus dorsi. *c*, Deltoides *d*, Triceps extensor cubiti. *e*, Gluteus maximus *f*, Biceps flexor cruris. *g*, Semitendinosus *h*, Semimembranosus. *i*, Gastrocnemius externus.

EXPLANATION OF PLATE V.

Heart and Blood-vessels in Situ, with some of the Muscles.

Muscles, &c. Superior Extremity.—a, Masseter. e, Thyroid gland. g, Trapezius. k Biceps flexor cubiti cut. l, Coraco-brachialis m, Triceps extensor cubiti. n, n, Heads of the pronator teres, flexor carpi radialis, and flexor digitorum sublimis cut. o, Flexor carpi ulnaris, cut at its extremity. P, Flexor digitorum profundus. q, Supinator radii longus, cut at its extremity. r, Ligamentum carpi transversal s, Extensores carpi radiales. t, Latissimus dorsi u, Anterior edge of the serratus anticus major V, V, Inferior part of the diaphragm. X, Kidneys. Y, Transversalis abdominis. z, Ilium.

Inferior Extremity.—c, Fleshy origin of the tensor vaginæ femoris. *g*, Great head of the triceps. h, Longhead cut. i, Vastus internus k, Vastus externus. l, Crureus. m, Gemelli n, Soleus. o, Tibia. p, Peronæus longus q, Peronæus brevis. r, Fibula.

Heart and Blood-vessels.—A. The heart with the coronary artery and veins. B. The right auricle of the heart. C. The aorta ascen

dens. D. The left subclavian artery. E. The left carotid artery. F. the common trunk which sends off the right subclavian and right carotid arteries. G. The external carotid. H. Facial artery, which sends off the coronary arteries of the lips. I. Arteria temporalis profunda. K. Aorta descendens. L, L. The iliac arteries, which send off M, M. the femoral or crural arteries. N.B. The other arteries in this figure have the same distribution as the veins of the same name; and generally, in the anatomical plates, the description to be found on the one side, points out the same parts in the other. 1. The frontal vein. 2. The facial vein. 3. Vena temporalis profunda. 4. Vena occipitalis. 7. The vascular arch on the palm of the hand, which is formed by the radial artery and vein, and the ulnar artery and vein. 10, 10. Cephalic vein. 12. Median vein. 13. The humeral vein, which, with the median, covers the humeral artery. 14, 14. The external thoracic or mammary arteries and veins. 15. The axillary vein, covering the artery. 16. The subclavian veins, which, with the jugulars, form 17, the vena cava superior. 18. The cutaneous arch of veins on the fore part of the foot. 20. The vena profunda femoris, covering the artery. 21. The upper part of the vena saphena major. 22. The femoral vein. 23, 23. The iliac veins. 24, 24. Vena cava inferior. 25, 25. The renal veins, covering the arteries. 26, 26. The diaphragmatic veins.

EXPLANATION OF PLATE VI.

Fig. 3. Thoracic Duct and Principal Trunks of the Absorbents.—1. Neck. 2, 2. Jugular veins. 3. Vena cava superior. 4, 4, 4, 4. Subclavian veins. 5. Aorta pulled to the left side by ligature. 6. Branches from the curvature of the aorta. 7, 7. Carotid arteries. 8, 8. First ribs. 9, 9. Trachea. 10, 10. Spine. 11, 11. Vena azygos. 12. Descending aorta. 13. Cœliac artery. 14. Superior mesenteric artery. 15. Right crus of the diaphragm. 16, 16. Two kidneys. 17. Right emulgent artery. 18. External iliac arteries. 19. Internal iliac artery. 20. Cavity of the pelvis. 22, 21. Spine of the os ilium. 22, 22. Groins. 23. Lymphatic glands in the groin into which lymphatic vessels are seen to enter. 24. Lymphatic vessels of the lower extremities passing under Pouparts' ligament. 25. Plexus of lymphatics. 26. Psoas muscle with lymphatics. 27. Another plexus of lymphatics. 28. Lymphatics passing over the os sacrum. 29. Right psoas with plexus on its inside. 30. Plexus on each side of the spine. 31. Spaces occupied by lymphatics. 32. Trunk of the lacteals on the under side of the superior mesenteric artery. 33. The same divided into two branches, one of which passes each side of the aorta. 34. Thoracic duct rising. 35. Passing under the right emulgent artery. 36. Penetrating the thorax. 37. Lymphatics joining it. 38. Passing under the aorta. 39. Plexus of lymphatics.

Fig. 2. Thoracic and Abdominal Viscera. 1. Vertebræ of the neck. 2. Jugular veins. 3. Subclavian veins. 4. Descending cava. 5. Right auricle. 6. Right ventricle. 8. Pulmonary artery. 10, 11. Lungs 13. Liver. 14. Broad ligament. 15. Gall-bladder. 16. Stomach. 17. Intestines. 18. Spleen.

Fig. 1. Abdominal Viscera.—1. Liver. 2. Round ligament. 3. Gall-bladder. 4. Pancreas. 6. Kidneys. 7. Aorta. 8. Vena cava. 10. A probe passed under the inferior mesenteric and spermatic vessels. 11. Parietes of the abdomen. 12. A portion of the same reflected. 13. Rectum. 14. Bladder of urine.

EXPLANATION OF PLATE VII.

Brain, Spinal Chord, and Nerves.—A, A. Anterior lobes of the cerebrum. B, B. Lateral lobes of the cerebrum. C, C. The two lobes of the cerebellum. D. Pons varolii, or tuber annulare. E. The passage from the third ventricle to the infundibulum. F. the medulla oblongata, which sends off the spinal chord. G, G. That part of the os occipitis which is placed above (H, H,) the transverse process of the first cervical vertebra. I, I, &c. The seven cervical vertebræ, with their intermediate cartilages. K, K, &c. The twelve dorsal vertebræ, with their intermediate cartilages. L, L, &c. The five lumber vertebræ, with their intermediate cartilages. M. The os sacrum. N. The os coccygis.

Nerves.—1, 1. The first pair or olfactory. 2, 2. The second or optic. 3, 3. The third or motores oculorum. 4, 4. The fourth or pathetici. 5, 5. The fifth or trigemini, its three branches being the opthalmic, the superior maxillary, and the inferior maxillary. 6, 6. The sixth or abductores. 7, 7. The seventh or auditores, composed of the portio dura, and portio mollis. 8, 8. The eighth or par vagum. 9, 9. The ninth for the tongue, 10, 10. The intercostal or great sympathetic. 11, 11. The accessoreus. 12, 12. The first cervical nerves. 13, 13. The second cervical. 14, 14. The third cervical. 16, 16. The brachial plexus 17, 17. The twelve dorsal, or, as they have been named, proper intercostal. 18, 18. The five lumbar. 19, 19. The sacro sciatic. 20. The stomachic plexus. 21, 21. Branches of the cœliac or solar plexus. 22, 22. Branches of the superior and inferior mesenteric plexuses. 23, 23. Nerves accompanying the spermatic chord. 24, 24. The hypogastric plexus.

EXPLANATION OF PLATE VIII.

Fig. 1. Organs of Sense.—Lachrymal canals, &c. the common integuments and bones having been taken away. *a*, Lachrymal gland. *b*, Puncta lachrymalia. *c*, Lachrymal sac. *d*, Lachrymal duct. *e*, Its opening into the nose. *f*, Caruncula lachrymalis. *g*, Eye-ball.

Fig. 2. Nerves and Muscles of the Right Eye, after part of the bones of the orbit has been cut away.—A, Eye-ball. B, Lachrymal gland. C, Abductor muscle. D, Attollens. E, Levator palpebræ superioris. F, Depressor oculi. G, Adductor. H, Obliquus superior. I, Its insertion into the sclerotic coat. K, Front

of the obliquus inferior. L, Anterior part of the frontal bone cut. M, Crista galli of the ethmoid bone. N, Posterior part of the sphenoid bone. O, Transverse spinous process of the ethmoid bone. P, Carotid artery, divided where it passes through the bone. Q, The artery within the cranium. R, Ocular artery.

Fig. 3. An Interior View of the Coats and Humours of the Eye.—*a a a a*, Tunica sclerotica cut in four angles and turned back. *b b b b*, Tunica choroides adhering to the inside of the sclerotic. *c c*, Retina which covers the vitreous humour. *d d*, Ciliary processes which are continued from the choroid. *e e*, Iris. *f*, Pupil.

Fig. 4. Eye-ball with its Muscles.—*a*, Optic nerve. *b*, Trochlearis muscle. *c*, Part of the os frontis to which the trochlea or pulley is fixed, through which *d*, the tendons of the trochlearis pass. *e*, Attollens oculi. *f*, Adductor oculi. *g*, Abductor oculi. *h*, Obliquus inferior. *i*, part of the superior maxillary bone to which it is fixed. *k*, Eye-ball.

Fig. 5. Anterior part of the Right External Ear, Cavity of the Tympanum, its small Bones, Cochlea, and semi-circular Canals.—*a*, Malleus. *b*, Incus with its long head resting upon the stapes. *c*, Membrana tympani. *d e*, Eustachian tube covered by part of *f f*, The musculus circumflexus palati, 1, 2, 3, Semicircular canals. 4, Vestible. 5, Cochlea. 6, Portio mollis of the seventh pair of nerves.

Fig. 6. Muscles which compose the Fleshy Substance of the Tongue.—*aa*, Tip of the tongue. *b*, Its root. *c*, part of the membrane of the tongue which covered the epiglottis. *d d*, part of the hyo-glossus muscle. *e*, lingualis or genio-glossus. *gg*, Part of the stylo-glossus.

Nerves. *a a*, Optic nerve. *b*, Third pair. *c*, Its joining with a branch of the first branch of the fifth pair to join *l*, the lenticular ganglion which sends off the ciliary nerves. *d, e e*, Fourth pair. *f*, Trunk of the fifth pair. *g*, First branch of the fifth pair. *h*, Frontal branch of it. *i*, Its ciliary branches along with which the nasal twig is sent to the nose. *k*, Its branch to the lachrymal gland. *l*, Lenticular ganglion. *m*, Second branch of the fifth pair. *n*, Third branch of the fifth pair. *o*, Sixth pair of nerves, which sends off *p*, the beginning of the great sympathetic. *q*, Remainder of the sixth pair spent on *e*, the abductor oculi.

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ANATOMY, COMPARATIVE.

1 This science, in its most comprehensive signification, implies (as we observed at the commencement of our article on Anatomy) a knowledge of the structure of *all organic* existence; but it is more usually limited in its signification to animal conformation, with the exception of man; and it is called comparative anatomy because it makes the structure of the human frame the standard of its comparisons.

2. This science is not only interesting in itself, as constituting a highly important part of scientific research, but it is also pregnant with utility to the individual whose enquiries are principally directed to the structure and organization of the human body; and it ought indeed to be regarded in all courses of anatomical instruction as an essential part of the teacher's duty to illustrate the human, by comparisons with the anatomy of the inferior animals, tracing the gradations from those which approximate nearest in structure to our own species, down to that part of the animal creation which almost blends itself with the vegetable tribe of existences. To the student in natural history and physiology comparative anatomy will prove of the most essential aid; for classification of organized beings must necessarily take anatomical structure as part of its basis, and a thorough insight into the rationale of function can only then be obtained, when we compare the functional peculiarities of one class of organized being with those of another.

3. Comparative anatomy, in its most limited signification, comprises of course an astonishing number and variety of particulars; and the best mode of arranging or classifying these particulars into a system of totality, constitutes, perhaps, even in the present day, a problem of no easy solution. *All* classification indeed that is founded upon the principles of possession and exclusion must necessarily be more or less defective; and no generalization can be adopted which shall be absolutely correct both in admission and omission.

4. Systematics have, for example, as we shall immediately see, proposed a main division of animals into those which have, and into those which are without vertebræ; but part of the definition of the vertebral class applies to the non-vertebral, and so, we repeat, it must ever be in all schemes of artificial arrangement; and yet these arrangements are necessary, inasmuch as without them the objects of research would possess in detail an intricacy and complication beyond the compass of the most analytical mind to grasp, or the best memory to retain.

5. In the present article we shall adopt the method of arrangement proposed and pursued by the justly celebrated Blumenbach; indeed, we do not know how better to present to our readers a system of comparative anatomy that shall be in accordance with our limits, than by abridging Mr. Lawrence's translation and commentary of Blumenbach's work, with the introductory essay that is appended to it.

6. Animals, in this system, are distributed into two leading divisions; those which have a vertebral column and red blood; and those which are without vertebræ and are white blooded.

7. Animals of the first division have always an interior skeleton; that is a bony structure covered by muscle and skin; they have a spinal marrow or cord contained in the vertebral canal; never more than four members, of which one, or both pairs, are in some instances wanting. The brain is contained in a cranium; there is a great sympathetic nerve, five senses, two moveable eyes, and three semicircular canals in the ear. The circulation is performed by one muscular ventricle at least; or rather it should be said, that animals of this last class have a heart with at least one ventricle. There are lymphatics, as well as blood-vessels. The jaws being placed horizontally, the mouth is opened by their moving from above downwards, or from before backwards. There is a continuous alimentary canal, peritonæum, liver, spleen, pancreas, two kidneys, and renal capsules, and two testicles.

8. The vertebral animals are subdivided into those which have warm, and those which have cold blood.

9. *Warm-blooded vertebral animals* have two ventricles to the heart, and a double circulation; that is, a pulmonary and general circulation; they breathe by means of lungs. The cranium is completely filled by brain. The eyes are closed by eye-lids. The tympanum of the ear is hollowed out of the cranium, and the labyrinth is excavated in the bone. Besides the semicircular canal there is a cochlea. The nostrils communicate with the fauces, and allow the passage of air into the lungs. The trunk is constantly furnished with ribs.

10. In *the vertebral animals with cold blood* the brain never entirely fills the cranium. The eyes seldom possess moveable eye-lids. When the tympanum exists, it is on a level with the surface of the head. There is no cochlea. The different parts of the ear are connected with the cranium but loosely.

11. The first of the above subdivisions, or the warm-blooded animals, contains two classes: *mammalia*, and *birds*.

12. The *mammalia* are viviparous, and suckle their young (from which circumstance the name is derived). They have an uterus with two cornua; and the male has a penis.

13. There are two occipital condyles, a very complicated brain; four little bones in the ear, and a spiral cochlea. The skin is covered with hair. A muscular diaphragm separates the chest from the abdomen. There is an epiglottis. The lower jaw only moves. The fluid in the lacteals is white, and passes through several conglobate glands. There is an omentum.

This class has the following orders:—

i. Bimanum, two-handed, of which, homo, man is the only genus.

ii. Quadrumana, four-handed; having a se-

parate thumb on both extremities. Teeth like those of a man, except that the *cuspidati* are usually longer. The genera are: 1. *Simiæ*, apes, monkeys, baboons. 2. *Lemur*, macauco.

iii. BRADYPODA. Slow moving animals. Genera: 1. *Bradypus*, sloth. 2. *Myrmicophaga*, ant-eater. 3. *Manis*, scaly lizard, or panygolin. 4. *Dasypus* or *Tatu*, armadillo.

iv. CHEIROPTERA, having the fingers elongated for the expansion of a membrane, which acts as a wing. Genus: *Vespertilio*, bat.

v. GLIRES, gnawing animals, having two long and very large incisor teeth in each jaw, with an interval behind unoccupied by cuspidati. Genera: 1. *Sciurus*, squirrel. 2. *Glis*, dormouse. 3. *Mus*, mouse and rat. 4. *Marmota*, marmot. 5. *Cavia*, guinea-pig. 6. *Lepus*, hare and rabbit. 7. *Jaculus*, jerboa, 8. *Castor*, beaver. 9. *Hystrix*, porcupine.

vi. FERÆ, predacious and carniverous animals. Very strong and large canine teeth; molares, forming pointed prominences. Short and simple alimentary canal. Genera: 1. *Erinaceus*, hedge-hog. 2. *Sorex*, shrew. 3. *Talpa*, mole. 4. *Moles*, badger. 5. *Ursus*, bear. 8. *Didelphis*, opossum, kanguroo. 7. *Vivura*, weasels, ferret, polecat, civet. 8. *Mustela*, stunk, stoat, &c. 9. *Canis*, dog, wolf, jackal, fox, hyena. 10. *Felix*, cat, lion, tiger, leopard, lynx, panther, &c. 11. *Lutra*, otter. 12. *Phoca*, seal, or sea-calf.

vii. SOLIDUNGULA, animals with a divided hoof; having a single toe on each foot, large intestines, and particularly an enormous cæcum. Incisores in both jaws. Genus: *Equus*, horse and ass.

viii. PECORA or BISULCA, with undivided hoof. No incisores in the upper jaw; stomach consisting of four cavities. Ruminating their food; long intestines. Genera: 1. *Camelus*, camel. 2. *Capra*, sheep, goat. 3. *Antelope*, antelope, chamois. 4. *Bos*, ox, buffalo. 5. *Giraffa*, giraffe, or cameleopard. 6. *Cervus*, elk, deer, hind. 7. *Moschus*, musk.

ix. BELLULÆ, having an unshapely form, and a tough and thick hide. More than two toes; incisores in both jaws; in some cases enormous tusks. Genera: 1. *Sus*, pig. 2. *Tapir*. 3. *Elephas*. 4. *Rhinoceros*. 5. *Hippopotamus*, sea-horse. 6. *Trichecus*, morse or walrus, manati or sea-cow.

x. CETACEA, whales living entirely in the sea, and formed like fishes; but breathing by an opening at the top of the head, called the *blowing-hole*; through which they throw out the water which enters their mouth with the food. Smooth skin covering a thick layer of oily fat. No external ear. A complicated stomach. Multilobular kidneys, larynx of a pyramidical shape opening towards the blowing-hole. Testes within the abdomen. Mammæ at the sides of the vulva. Bones of the anterior extremity concealed, and united by the skin so as to form a kind of fin. Genera: 1. *Monodon*, narwhal, sea-unicorn. 2. *Balæna*, proper whale. 3. *Physeter*. 4. *Delphinus*, dolphin, porpoise.

14. The second division of warm-blooded animals or BIRDS are oviparous; having a single ovary and oviduct; a single occipital condyle; a very large sternum and anterior extremity adapted for flying.

They have three eyelids; no external ear; a cochlea conical, but not spiral, a single ear-bone; body covered with feathers. Lungs attached to the surface of the chest, and penetrated by the air, which goes all over the body; a larynx at each end of the trachea; no epiglottis. Jaws covered with a horny substance. Chyle transparent; no mesenteric glands, nor omentum. No urinary bladder; the ureters terminating in a bag through which the eggs and fæces come, viz. the cloaca.

This class of birds, is subdivided into first, TERRESTRIAL, and second, AQUATIC BIRDS. The following are the orders:—

15. I.—OF THE TERRESTRIAL.

i. ACCIPITRES. Birds of prey; with strong hooked bills, and large curved talons, a membranous stomach, and short cæca. Genera: 1. *Vultur*, vultures. 2. *Falco*, falcon, eagle, hawk, kite. 3. *Strix*, owl. 4. *Lanius*, shrike or butcher-bird.

ii. LEVIROSTRES, light-billed birds, having a large hollow bill. Genera: 1. *Psittacus*, parrot kind. 2. *Ramphastos*, toucan. 3. *Buceros*, rhinoceros bird.

iii. PICÆ. (This and the two following orders are not clearly characterized.) Genera: 1. *Picus*, woodpecker. 2. *Jynx*, wryneck. 3. *Sitta*, nuthatch. 4. *Alcedo*, kingfisher. 5. *Trochilus*, humming birds, &c. &c.

iv. CORACES. Genera: 1. *Corvus*, crow, raven, jackdaw, magpie, jay, &c. 2. *Coracias*, roller. 3. *Paradisea*, birds of paradise. 4. *Cuculus*, cuckoo, &c. &c.

v. PASSERES, small singing birds, genera:— 1. *Alauda*, lark. 2. *Sturnus*, starling. 3. *Turdus*, thrush, blackbird. 4. *Emberiza*, bunting. 5. *Fringilla*, finches, canary bird, linnet, sparrow. 6. *Motacilla*, nightingale, red-breast, wren. 7. *Hirundo*, swallows, martins, &c. 8. *Caprimulgus*, goat-sucker, &c.

vi. GALLINÆ, gallinaceous birds, mostly domesticated, having a large crop; strong muscular gizzard. Genera: 1. *Columba*, pigeons. 2. *Tetrao*, grous, quail, partridge. 3. *Numida*, guinea-fowl. 4. *Meleagris*, turkey. 5. *Pavo*, peacock, 6. *Otis*, bustard.

vii. STRUTHIONES, struthious birds. The largest of the class; possessing extremely small wings, and therefore incapable of flight; but run very swiftly. Genera: *Strathio*, ostrich. 2. *Cassuarius*, cassowary or emu.

16. II.—AQUATIC BIRDS.

i. GRALLÆ, waders, frequenting marshes and streams; long naked legs; long neck; cylindrical bill, of different lengths. Genera: 1. *Ardea*, crane, stork, heron, bittern. 2. *Scolopax*, woodcock, snipe, curlew. 3. *Tringa*, lapwing ruffs, and reeves. 4. *Charadrius*, plover. 5. *Fulica*, coot. 6. *Rallus*, rail. 7. *Phœnicopterus*, flamingo. 8. *Tantalis*, ibis, &c.

ii. ANSERES, swimming birds, web-footed, bill broad and flat, covered by a somewhat soft substance, on which large nerves are distributed. Genera: 1. *Colymbus*, diver. 2. *Larus*, gull. 3. *Procellaria*, petrel. 4. *Diomedea*, albatross. 5. *Pelecanus*, pelican, cormorant. 6. *Anas*

swan, duck, goose. 7. *Mergus*, gossander. 8. *Alca*, awk, puffin. 9. *Aptenodytes*, penguin.

18. AMPHIBIA *and* FISHES *constitute the two classes of* COLD-BLOODED VERTEBRAL ANIMALS.

These Amphibia differ very materially from each other, having very few characters in common; for, in different instances, they walk, fly, swim, and crawl. There is no external ear, nor cochlea; the brain is always very small. The lungs are in the same cavity with the other viscera; no epiglottis, omentum, or mesenteric glands. Two ovaries and two oviducts. Cloaca, through which the fæces and urine are expelled; and in which the organs of generation terminate. Neither hair, feathers, nor mammæ.

19. Reptilia, having four feet. Genera: 1. *Testudo*, tortoise, turtle. 2. *Rana*, frog, toad. 3. *Lacerta*, lizard, crocodile, chamæleon, newt, salamander, iguana, &c.

20. Serpentia. No external members; body of an elongated form, and viscera of a similar shape. They are oviparous; but the egg is sometimes hatched in the oviduct. Both jaws moveable. Genera: 1. *Crotalus*, rattlesnake; 2. *Boa*, immense serpents of India and Africa; 3. *Coluber*, viper; 4. *Anguis*, blindworm; 5. *Amphisbæna;* 6. *Cæcilia*.

21. Fishes breathe by means of branchiæ or gills; having no trachea nor larynx. Organs of motion consisting of fins. Nose unconnected with the organs of respiration. Ear entirely enclosed in the head; the tympanum, &c., being absent. Both jaws moveable. The place of the pancreas supplied by the pyloric cæca. An urinary bladder. Two ovaries. Heart consisting of a single auricle and ventricle. This class may be distributed into two leading divisions; the *cartilaginous;* whose skeleton consists of cartilage; the *bony*, where it is formed of a more firm substance.

22. Cartilaginous Fishes.

i. Chondropterygii, having no gill cover; an uterus with two oviducts. Genera: 1. *Petromyzon*, lamprey. 2. *Gastrobranchus*. 3. *Raia*, skate, torpedo, sting-ray. 4. *Squalus*, shark, saw-fish. 5. *Lophius*, sea-devil, frog-fish. 6. *Balistes*, file-fish. 7. *Chimæra*.

ii. Branchiostegi, having a gill cover. Genera: 1. *Accipenser*, sturgeon, beluga. 2. *Ostracion*, trunk fish. 3. *Tetrodon*. 4. *Diodon*, porcupine fish. 5. *Cyclopterus*, lump-sucker. 6. *Centriscus*. 7. *Syngnathus*, pipe fish. 8. *Pegasus*.

23. Bony Fishes.

i. Apodes. No ventral fins. Genera: 1. *Muræna*, eel-kind. 2. *Gymnotus*, electric eel. 3. *Anarrhichas*, sea-wolf. 4. *Xiphias*, sword-fish. 5. *Ammodite*, launce. 6. *Ophidium*. 7. *Stromateus*. 8. *Trichiurus*.

ii. Thoracici. Ventral fins directly under the thoracic. Genera: 1. *Echeneis*, sucking-fish. 2. *Coryphæna*, dorado. 3. *Zeus*, dory. 4. *Pleuronectes*, flounder, plaice, dab, holibut, sole, turbot. 5. *Chætodon*. 6. *Sparus*. 7. *Perca*. 8. *Scomber*, mackarel, bonito, tunny. 9. *Mullus*, mullet, &c. &c.

iii. Abdominales. Ventral fins behind the thoracic; (chiefly inhabit fresh water). Genera: 1. *Cobitis*, roach. 2. *Silurus*. 3. *Salmo*, salmon, trout, smelt. 4. *Esox*, pike. 5. *Clupea*, herring, sprat, shad. 6. *Cyprinus*, carp, tench, gold-fish, minow, &c. &c.

iv. Jugulares. Ventral fins in front of the thoracic. Genera: 1. *Gadus*, hadock, cod, whiting, ling. 2. *Uranoscopus*, star-gazer. 3. *Blennius*, blenny. 4. *Callionymus*, dragonet. 5. *Tachinus*, weaver.

24. The animals without vertebræ are not possessed of so many characters in common, as the vertebral. Their hard parts, when they have any, are generally on the *outside* of the body. The centre of the nervous system, instead of being enclosed in a bony case, lies in the same cavity with the viscera. The œsophagus is generally surrounded by a nervous chord coming from the brain. Their respiration is not carried on by lungs; they have no voice. Their jaws move in various directions. They have no urinary secretion.

25. This class of animals was divided by Linnæus into *insects* and *worms* (vermes), but a recent subdivision has been adopted of the insects into *crustacea* and *insecta;* and of the vermes into *molluca vermes* and *zoophyta*.

26. The Crustacea have a hard external covering, and numerous articulated members. A long nervous chord beset with ganglia; compound eyes; antennæ and palpi like those of insects; a heart and circulating vessels, and gills. Teeth in the cavity of the stomach. *Genera*: 1. *Cancer*, crab, lobster, cray-fish, shrimps, 2. *Monoculus*.

27. The Insecta have articulated members and antennæ. Those which fly are subject to what is called a *metamorphosis*, they pass through certain intermediate states of existence before they assume the last or perfect form. From the egg proceeds the *larva*, or caterpillar; this changes to the *chrysalis*, *nympha*, or *aurelia;* from which the perfect insect is produced. Nervous system consisting of a chord beset with ganglia; no heart, nor blood-vessels; respiration carried on by means of tracheæ.

i. Coleoptera, having a hollow horny case, under which the wings are folded. Genera: 1. *Scarabæus*, beetle. 2. *Lucanus*, stag-beetle. 3. *Dermestes*. 4. *Coccinella*, lady-bird. 5. *Curculio*, wævil. 6. *Lampyris*, glow-worm. 7. *Melæ*, Spanish fly. 8. *Staphylinus*. 9. *Forsicula*, earwig.

ii. Hemiptera. Four wings, either stretched straight out, or resting across each other. Genera: 1. *Blatta*, cock-roach. 2. *Gryllus*, locust, grasshopper. 3. *Fulgora*, lantern-fly. 4. *Cimex*, bug, &c. &c.

iii. Lepidoptera. Soft hairy body and four expanded wings, Genera: 1. *Papilio*, butterfly. 2. *Sphinx*. 3. *Phalena*, moths.

iv. Neuroptera. Four reticulated wings. Genera: 1. *Libellula*, dragon-fly. 2. *Ephemera*, &c.

v. Hymenoptera. Generally possessing a sting. Genera: 1. *Vespa*, wasp, hornet 2. *Apis*, bee, 3. *Formica*, ant. 4. *Termes*, white-ant. 5. *Ichneumon*, &c. &c.

vi. DIPTERA; two wings. Genera: 1. *Œstrus* gad fly. 2. Musca common flies. 3. *Culex* gnat, musquito. 4. *Hippobosca*, horse-leech, &c.

vii. APTERA, no wings: 1. *Podura*, spring-tail. 2. *Pediculus*, louse. 3. *Pulex*, flea, chigger. 4. *Acarus*, tick, mite. 5. *Aranea*, spiders. 6. *Scorpio*, scorpion.

28. The MOLLUSCA derive their name from the soft fleshy nature of their body. This class includes those pulpy animals which may be either destitute of an external covering (the *mollusca nuda*), as the bug; or may be enclosed in one or more shells, as the snail, oyster, &c. when they are termed *testacea*.

29. The animals of this class have no articulated members; they have blood-vessels, and a true circulation. They respire by means of gills. They have a distinct brain giving origin to nerves and a spinal marrow. Genera: 1. *Sepia*, cuttle-fish. 2. *Argonauta*. 3. *Nautilus*. 4 *Limax*, slug. 5. *Aplysia*. 6. *Doris*. 7. *Clio*. 8. *Patella*, limpet. 9. *Helix*, snail. 10. *Haliotis*. Venus' ear. 11. *Murex*, caltrop, or rock spell. 12. *Strombus*, screw. 13. *Buccinum*, whelk. 14. *Ascidia*. 15. *Thalia*. 16. *Ostrea*, oyster. 17. *Solen*, razor-shell. 18. *Cardium*, cockel. 19. *Mytilus*, muscle, &c. &c.

30. The VERMES are divisible into two orders: the *intestinal*, which inhabit the bodies of other animals, and the *external*.

31. The former are less complicated in their organization than the latter, so that they are sometimes arranged in the lowest class, or zoophytes. The external worms have a nervous chord, possessing ganglia, an elongated body, composed of rings, and having no distinct head. There are no members. Circulating vessels, but no heart. No nerves have been discovered in the intestinal worms.

i. INTESTINI. Genera: 1. *Gordius*, guinea-worm. 2. *Ascaris*, thread-worm, round worm. 3. *Tricocephalus*. 4. *Fasciola*, fluke. 5. *Tænia*, tape-worm. 6. *Hydatis*, hydatid.

ii. EXTERNI. Genera: 1. *Aphrodite*, sea-mouse. 2. *Sipunculus*. 3. *Hirudo*, leech. 4. *Nereis*. 5. *Nais*. 6. *Planaria*. 7. *Lumbricus*, earth-worm, &c.

32. The ZOOPHYTES have neither brain nor nerves, no heart, nor perhaps blood-vessels; no articulated members.

i. ECHINODERMATA, covered by a hard and tough coriaceous skin. Genera: 1. *Echinus*, sea hedge-hog. 2. *Asterias*, star-fish, &c.

ii. GELATINOUS. Genera: 1. *Medusa*, sea-blubber, sea-nettles. 2. *Actinia*, sea-anemone. 3. *Hydra*, fresh-water polype.

iii. INFUSORIA (animalcules of infusion). Genera: 1. *Vorticella*, wheel animal. 2. *Brachionus*, 3. *Vibrio*, eel of vinegar. 4. *Volvox*. 5. *Monas*.

iv. Inhabitants of Corals, Corallines, Sponges, &c.

33. Having thus gone through the general arrangement and classification of animals, founded on their anatomical structure, we now proceed to the extent of our limits in more particular designations and description.

We commence with the SKELETON OF THE MAMMALIA.

34. The *cranial bones* of the mammalia are, on the whole, the same as in the human subject. Most of the *horned animals* have it divided into two equal portions, and in these the two parietal bones are often consolidated into one.

35. The *crista occipitalis* of the mammalia generally bear a determinate proportion to the size of the jaws. It is wanting in the *orang outang*, but is very large in the *baboon of Borneo*. The longitudinal *crista* is very strongly expressed in the badger, and the *transverse ridge* is remarkable in the *beaver*. The sutures of the cranium are generally less intricate than in the human subject. The occipital foramen is in most quadrupeds at the extremity of the cranium, and obliquely, with the posterior border turned up. The facial bones are very different in form and prominence. The upper jaw bones do not, as in man, touch each other; but are separated by an *intermaxillary* bone, which, both in shape and magnitude, varies much in the different species of the mammalia. It has been said to be wanting in some of the monkey tribe. In the upper jaw of most *pecora* there are remarkable impressions near the nasal bones. In several web-footed and digitated mammalia (viz. the *otter*, *beaver*, *opossum* and *guinea-pig*) there is a peculiar bone interposed between the cheek bone and os temporis. The zygoma is very differently formed in animals, from man—differences which are derived from varieties in the organs of mastication. The *elephant* possesses only a sort of imitation of the nasal bones. In most apes, and in the *orang outang*, there is a single small nasal bone. In the greater number of quadrupeds, however, there are two nasal bones, and of considerable magnitude. The *ossa unguis* are entirely wanting in the elephant. The orbits have for the most past a lateral direction. In the *simiæ* they are directed forwards, as in man. In the beaver they point upwards.

36. The skeleton of quadrupeds deviates more from man in the form of the *lower maxilla* than in any other part. The form of the chin forms indeed the most peculiar characteristic of the human countenance. Man has also the shortest jaw in comparison with the cranium; the elephant perhaps approaching nearest to him in this particular. There is a marked difference also in the condyles of this bone.

37. The jaws of the mammalia contain teeth, with a few exceptions; it is said that the proper whales (the *balænæ*), the *manis* (scaly lizard), and American ant-eaters are the only genera entirely destitute of these organs. The whales have instead of teeth the peculiar substance called *whale-bone*, covering the palatine surface of the upper jaw. The enamel of the teeth is wanting in the tusks of the elephant, as also in those of the *walruss*, and of the *narwhal*; the ivory of the elephant's is pecular in its structure.

38. The teeth of mammalia may be distinguished into three distinct classes: *front teeth*, *corner teeth*, and *back teeth*; the first are the *incisores* or *cutting* teeth; the corner teeth are the *canini* or the *cuspidati* of Hunter; the back teeth are the *molares* or grinders. The for-

tusk is applied to such as extend out of the cavity of the mouth. The back teeth are the most universal. There is no animal in which the teeth are of such equal height and such uniform arrangement as in man.

Of the Trunk of the Mammalia, including the *spine*, *pelvis*, and *chest*.

39. The spine is confined to the red-blooded animals. The cervical vertebræ are always the same in number, being seven, as in the human subject. The *atlas* is distinguished in the *feræ* by its immense strength, and by the vast size of its transverse processes. The number of dorsal vertebræ is regulated by the ribs, and the lumbar vertebræ vary much in number. The form and proportions of the sacrum are still more various. The *cetacea* having no pelvis are in strict propriety without a sacrum. The os coccygis is prolonged so as to form the tail of quadrupeds. The pelvis (which is indistinctly formed, and indeed in no animal but man has the basin-like appearance justifying the name), is constituted of the ossa innominata together with the sacrum. Those apes which most resemble man have these ossa innominata much elongated.

40. The thorax in most, if not in all animals of the class mammalia, is narrower and on the contrary deeper from the spine to the sternum than in man, the ribs being not so curved and the sternal bone longer. In most animals the ribs are more in number than in man. The sternum is generally cylindrical and jointed.

41. Extremities.—In those quadrupeds that make much use of the front extremities there is a clavicle. Many others, especially the *feræ*, have in its place a small bone merely connected to the muscles. In all red-blooded animals which have anterior extremities a scapula is found. The coracoid process and acromion, the two chief projections of this bone, are strongest in such animals as have properly formed and long clavicles. With respect to the anterior extremities, properly so called, the *bat* and the *mole* present the most wide deviations from the ordinary formation of these parts. The radius is deficient in the fore-arm of the former; the thumb is shorter and furnished with a hook-like nail, while the phalanxes of the four fingers, between which the membrane of the wing is expanded, are extremely long. The *flying-squirrel* has a sharp-pointed bone at the outer edge of its carpus. The form of the os humeri in the mole is altogether without a parallel; it is thin and curiously expanded at either extremity. This animal has likewise a peculiar falciform bone lying at the end of the radius. Those animals that have divided claws and hoofs have some peculiarities in the *metacarpus* and *metatarsus*.

42. As to the posterior extremity, the femur of most quadrupeds is much shorter than the tibia, and hence it hardly projects from the abdomen. In some few, as in the *bear*, the femur is longer, as is also the case in some *apes*. The *cervi* want the fibula almost universally. In some *quadrumana*, as the *orang-outang*, the two posterior phalanges of the toes are remarkably curved in their shape.

43. Skeleton of Birds.—The skull of this class of animals is consolidated in the adult state into one single piece. Birds have only a single condyle, which is placed at the anterior margin of the great occipital foramen. There is also in this whole class a bone of a squarish figure, by which the lower jaw is articulated with the cranium on both sides, in the neighbourhood of the ear. Birds have the ossa unguis, which are of considerable size. The maxillæ are completely destitute of teeth; the upper one has more or less of motion; in most instances it is connected into one piece with the cranium, by means of yielding and elastic bony plates. The orbits are separated in some of the class, by a membranous partition only; in others by a more or less complete bony septum. The orbits are of great size in the whole class.

44. The cervical vertebræ of birds are numerous and very moveable: the *raven* has twelve, the *cock* thirteen, the *ostrich* eighteen, the *stork* nineteen, and the *swan* twenty-three. The dorsal vertebræ possess but little motion. There are no lumbar vertebræ, nor any coccygeal prolongation into a true-jointed tail.

45. The pelvis of birds is chiefly formed by a broad and simple os innominatum; but this bone does not unite below so as to form a symphisis pubis. The *ostrich* is an exception to this last rule.

46. Birds have fewer ribs than the mammalia; their sternum is prolonged below into a vertical process for the attachment of the strong pectoral muscles. In the *ostrich* and *cassowary* this prolongation is wanting.

47. The wings are connected to the trunk by means of three remarkable bones. The clavicles, which are always strong, constitute straight cylindrical bones. Their anterior extremities are connected to the sternum by means of a bone peculiar to birds, viz. the *fork-like bone*, or, as it is more commonly called, the *merry-thought*. The bones of the wing may be compared on the whole to those of the upper extremities in man, or the quadrumana, and consist generally of an os humeri, two bones of the fore-arm, two of the carpus, two, which are generally consolidated together, of the metacarpus; one bone of the thumb, and two fingers. The bones of the *penguins'* wings have a flattened form, as if they had been pressed; at the elbow there are two supernumerary bones, and the thumb bone is entirely wanting.

48. The bones of the lower extremities comprehend only the femur, and the tibia, the fibula being anchylosed to the tibia, one metatarsal bone, and the toes. The *psittaci* have a peculiar cross bone to the great toe.

Skeleton of the Amphibia.

49. *Turtles and Tortoises* (the *testudines*) have a kind of os intermaxillare in the upper jaw; but they are entirely toothless. The cavity containing the brain is extremely small in comparison with the size of the cranium.

50. The trunk is consolidated with the two great shells of the animal; the dorsal vertebræ and ribs being attached to the upper, the sternum being fixed in the lower or abdominal shell. The upper bony covering, or that of the back, consists

of about fifty pieces, which are partly connected together by real sutures.

51. The same bones are found in the pelvis of these animals as in the mammalia; but the ossa pubis are the largest, while the ilia are the smallest.

52. The scapula is situated towards the under part of the animal, just behind the abdominal shell. The clavicle consists of two pieces, joined at an acute angle, to which the humerus is articulated.

53. *Frogs* and *toads* have no teeth. Their spine is short; terminating behind in a straight and single bone, which is received into the middle of the somewhat forked-like os innominatum. They have no ribs. The scapula is joined to the sternum, with a pair of bones corresponding to the clavicles. The bone of the fore-arm and leg consists of a single piece, solid in the middle, but divided at either extremity into two conical portions, having medullary cavities.

54. The *crocodile* has jaws of immense size. The anterior part of the upper jaw consists of a large intermaxillary bone, and the lateral portions of the lower maxilla are formed of several pieces joined together. This animal has an abdominal sternum, which extends from the ensiform cartilage to the pubis.

55. *Serpents* have an upper jaw unconnected with the rest of the skull, and more or less moveable of itself. The innoxious species have in the upper jaw four maxillary bones beset with small teeth, forming two separate rows; one being placed along the front edge of the jaw, the other is found more internally, and is situated longitudinally on either side of the palate; the external row is wanting in the poisonous species, and in their stead there are tabular fangs connected with the poison-bladder, and constituting bony excretory ducts which convey the venom into the wound, inflicted by the bite of the animal. These animals have most numerous vertebræ, sometimes more than 300; and they have by far the greatest number of ribs, amounting in some to 250 pairs. They are the only red-blooded animals that have no sternum.

Skeleton of Fishes.

56. Fishes in general have a spine which extends from the cranium to the tail fin; and they for the most part are uniform in having the other fins, particularly those of the thorax and abdomen, articulated with peculiar bones destined for that purpose.

57. The *cranium* in several cartilaginous fish, as in the *skate*, consists of one large piece. In the bony fishes the component parts of the skull are, on the contrary, numerous. The bones in the head of the perch amount to eighty. Most of the bony fishes have a more or less moveable under jaw.

58. Some of these genera, as the sturgeon, are without teeth; while others, as the shark tribe, have very numerous teeth. The *white shark* has more than 200 lying in rows, almost like the leaves of an artichoke; those of the front row only having a perpendicular direction. The saw-fish only has teeth implanted in the bone on both sides of the sword-shaped organ, with which its head is armed. In some fishes the palate, in others the tongue bone, and in others the aperture of the mouth, forms a continuous surface of the teeth. There is, in fact, the greatest variety in the teeth of this class of animals.

59. The spine of long fishes with short fins, consists of a great number of vertebræ, some of the sharks have more than 200. The spinal marrow passes above the vertebral bones in a separate canal at the roots of the spinal processes. The ribs are articulated to what are called the dorsal vertebræ, generally; but in cartilaginous fishes, proper ribs cannot be said to exist. Many fishes are furnished with bones that have no other than a muscular connection.

Of the Œsophagus and Stomach in the Mammalia.

60. Cheek pouches are common to many species of the genus *simia*, and some others. In most of the mammalia salivary glands are found without much variation in structure; but none possess an uvula except man and the simiæ; the peculiar glandular and moveable bag which is placed behind the palate, has hitherto been only observed in the camels of the old world.

61. The œsophagus of quadrupeds has two rows of muscular fibres, which pursue a spiral course, and decussate each other. This passage in the wolf, and in animals who swallow voraciously, is very large. The coats of the stomach, especially the muscular coat, are very strong in the carnivora. In some herbivora the stomach has an uniform appearance externally, but internally it is divided into two portions by a remarkable difference in the two halves of its internal coat, as in the *horse*, or by a valvular elongation of the membrane, as in some animals of the *mouse kind*, and in the *hare* and *rabbit*. In some other mammalia the stomach is positively divided into two or more portions; but the most complicated stomach is found in the *ruminating* animals; of this, the *cow* and *sheep* may be taken as examples. The first stomach, or *paunch*, is by far the largest in the adult animal; it has numerous rugæ on its internal coat. The second stomach is a sort of globular appendage to the paunch, the internal coat of which is elegantly arranged into polygonal and acute-angled cells, or superficial cavities. The third stomach has been compared, as to its form, to a hedge-hog rolled up; its internal coat is contracted into very numerous broad duplicatures. The fourth is next in size to the paunch; the internal coat of this is villous, like the human stomach. A groove-like continuation of the œsophagus connects the three first stomachs in a very remarkable way. The *camel* and the *lama* have very numerous cells in the first and second stomach, which are closed and opened at will by muscular bands; these cavities have been found in a dead camel capable of holding two gallons of fluids. In the *opossum* the two openings of the stomach are placed near to each other; and at the orifice of the *beaver's* stomach there is a peculiar glandular body full of cavities that secrete mucus. The *manati* have a very

large gland near the œsophagus; and Home has described a glandular structure near the pylorus in the *sea-otter*. Macartney has likewise discovered an arrangement of glandular bodies round the termination of the œsophagus in the *dormouse*. The stomach of the *pangolin* is almost as thick and muscular as that of the gallinaceous fowls.

Œsophagus and Stomach of Birds.

62. The male *bustard* has what is called the *throat-sack* under the integuments in front of the neck; and a remarkable dilatation of the fauces occurs in the *pelican;* many carnivorous birds have the œsophagus of great size, and it expands into what is called the *crop*, just before the sternum, which organ (the crop) is furnished with numerous mucous or salivary glands; it exists in all the gallinæ, and in some birds of prey. Another glandular and secretory organ, and which is much more common than the crop, is placed before the entrance of the œsophagus into the proper stomach. In the *crane*, *stork*, &c. this organ is larger than the stomach; in gallinaceous fowls it is much smaller. In most birds the stomach lies at the upper part of the abdomen; in the *cuckoo* it lies below; and so it does in the *ramphastos*, and in the *corvus caryocatactes* (the nut-cracker).

63. The gizzard of the cuckoo is covered internally with short, bristly, and spiral hairs,

64. The stomachs of birds which feed on flesh and insects are thin and membranous, while the granivorous tribe have strong muscular stomachs. Every part of the organ is calculated for producing powerful trituration.

Œsophagus and Stomach of the Amphibia.

65. The *turtle* has a very capacious stomach, and its internal coat is beset with innumerable large, firm, and pointed processes of a white colour. The œsophagus of the *crocodile* is funnel-shaped; its coat is thick, and its two apertures are near each other. In *serpents* the œsophagus and stomach are scarcely distinguishable: the œsophagus in this tribe is often of immense magnitude.

Œsophagus and Stomach of Fishes.

66. In most animals of this class the œsophagus is short, it is of great width, and is distinguished in many with difficulty from the stomach. The coats of the stomach in most fishes are thin, and, for the most part, widely different from that of granivorous birds.

Œsophagus and Stomach of Insects.

67. In most of this tribe, which are subject to a metamorphosis, the stomach in the larva state is of a great size in comparison with the short intestinal canal; while those on the contrary which take little or no nourishment in their perfect state, have this organ remarkably diminished, and as it were contracted. In several cases the commencement and termination of the alimentary canal, the œsophagus and rectum, are surrounded by an annular portion of the spinal marrow.

68. In the *ear-wig (forficula auricularia)* the upper orifice of the stomach is furnished with two rows of teeth; in some of the *grylli* (*grasshoppers*) the stomach itself is small, but the œsophagus much larger. In some of that genus it consists of three or four vesicular portions, resembling in a degree the stomachs of the ruminating animals. The *lobster* and some other species of the genus *cancer* have several portions of bone connected with the stomach, which contains also three teeth, which, together with the stomach itself, are annually produced, at least in the *craw-fish*.

Œsophagus and Stomach of Worms.

69. The *aphrodite aculeata* (sea-mouse) has a stomach resembling in size and form the *date*, while in strength and compactness of texture, it approaches to that of granivorous birds. In many of the *testacea* the œsophagus is expanded into a crop, covered internally with numerous small teeth. The *bulla lignaria* contains three hard calcareous shells, by which the animal is enabled to bruise and masticate the other testacea on which it feeds. In most of the mollusca, the stomach is of a simple membranous structure, and of very different comparative magnitudes. It occupies the greatest part of the body in the *leech*, and it is internally divided into ten separate portions by imperfect partitions. The armed *polypes* (*hydar*) and other similar *zoophytes*, can scarcely be considered as any thing more than a mere stomach having its opening furnished with tentacula.

Intestinal Canal of the Mammalia.

70. Carnivorous animals have this generally shorter than the herbivorous; but this rule is not without exceptions.

71. In most mammalia the valvulæ conniventes of the small intestines are more faintly marked than in man. In some the *villi* of the small intestines are remarkably long and numerous as in the *bear*.

72. Many of the *carnivora* have no cæcum; it is also wanting in some *herbivora*, but in some of the latter description it is of enormous size. Many are without the *vermiform appendix*, even some of the *simiæ*.

73. In most of the herbivorous mammalia, the colon is long, large, and divided into cellular compartments. This is remarkably the case with the *elephant* and *horse*. In a few instances, as in the *beaver* and *sloth*, the rectum and urethra have a common termination, which may be compared to the cloaca of birds.

Intestinal Canal of Birds.

74. The alimentary canal in this class is much shorter than in the mammalia; it is also generally shorter in carnivorous birds, than in such as derive their food from the vegetable kingdom. In birds there is scarcely any perceptible difference between the large and small intestines. Most birds have two cæca; some only one, and some of the predacious kind want it altogether. The rectum ends in a part called the cloaca, which is an expanded portion, containing the terminations of the ureters, the genital organs, and the *bursa Fabricii*.

75. Intestinal Canal of the Amphibia.

The *hawks-bill turtle* (*testudo carretta*) has an intestinal canal five times as long as the whole animal, which has longitudinal folds internally that are covered with an abundance of mucus, (which is the case with the whole class).

76. In the *coluber natrix* the whole length of the intestinal canal does not equal the length of the animal. The small intestine forms a very considerable *Fallopian valve*, by a prolongation at its entrance into the large.

77. Intestinal Canal of Fishes.

This with a few exceptions, is extremely short. In some as in the *torpedo*, it is only half as long as the stomach; but the passage of the chyle is lengthened in this and some other cartilaginous fishes by a spiral valve.

78. The *appendices pyloricæ* are common to most fishes; they sometimes open at the lower orifice of the stomach, but generally at the commencement of the intestinal canal, and secrete a digesting fluid. In some these are collected into one glandular body, which has been compared to the pancreas of warm-blooded animals.

79. Intestinal Canal of Insects.

The want of mesentery chiefly distinguishes the alimentary canal of this tribe from that of the red-blooded animals. Many of them have the appendices just spoken of. The intestinal canal varies much in the different genera and species of insects; it may be stated on the whole, that a long and complicated intestinal tube denotes that the insect feeds on vegetables; while the contrary characters indicate animal food. Between the larva, and the perfect insect, great difference is often found.

80. Intestinal Canal of Vermes.

Several of the *mollusca* have the appendices. Those testacea which remain fixed in one situation, have a shorter and more simple intestinal canal than those which have the power of locomotion. It has been stated that the rectum passes directly through the heart in most of the bivalves. In the *limax* (*slug*), as well as in the *helix*, the rectum opens on the front of the limbus, close to the air hole. The leech can hardly be said to have an intestine; yet it has an anus at the end of its tail, through which some little fæcal matter is evacuated. The *armed polypes* have not even this opening.

81. Of the Liver, Spleen, and Omentum.

(a) *Mammalia.*—The liver of animals in this class has two peculiarities; first, in some genera and species it transmits all the bile immediately into the duodenum. Secondly, in several others a part of this fluid is previously collected in the gall-bladder. Animals of the *horse* and *goat* kind, and the *cetacea* are without a gall-bladder. In some animals who have a gall-bladder, as in the *horned cattle*, there is a direct communication between it and the liver.

In the *ox* and *sheep*, the spleen is cellular.—The mammalia alone possess a proper omentum; and the spleen in this class is very different from the same viscus in the other classes.

(b) *Birds.*—In domesticated birds the liver becomes larger than it is in wild ones. Some species of this class, as the *pigeon*, *parrot*, &c. are without gall-bladder.

(c) *Amphibia.*—The liver of this tribe is always large, and in some cases, as the *salamander* of immense magnitude. The yellow appendices that are found in the *frog* on either side of the spine, have been considered a kind of omentum but the resemblance is remote.

(d) *Fishes.*—In many animals of this class the alimentary canal is surrounded by a lon liver. Some fishes have an abundance of oil i this organ; as for instance the *skate* and *co* It is wanting in some few species.

(e) *Insects.*—In animals of this class whic have a heart, and in those only, an organ found which secretes bile, viz. in the genu *cancer*.

(f) *Vermes.*—The organs which secrete an contain the fluid of the *cuttle-fish* have been r garded as of a biliary nature. Thus the *myt* has been called the liver, and the *ink-bag* th gall-bladder (but this is a mistake).

Several *testacea* have a liver surrounding th stomach, and pouring its bile into the cavity that organ. In many snails it occupies th upper turn of the shell.

The pancreas, it may be observed, is near the same in the mammalia, birds, and reptile as in man. In most fishes the situation of th organ is occupied by the cæcal appendices, py loric cæca.

82. Of the Urinary Organs.

(a) *Mammalia.*—In some animals of this cla as the *bear*, the kidney resembles a bunch grapes. In most quadrupeds the urinary bladd is more loose in the abdomen than it is in man. is comparatively much smaller in carnivoro than in herbivorous animals.

(b) *Birds.*—The urinary bladder is wanti in this whole class, and the ureters open into t cloaca; the kidneys in most birds form a doul row of glandular bodies, placed on both sides the lumbar vertebræ.

(c) *Amphibia.*—The *testudo*, and *rana*, ha an urinary bladder, which is double in many the frogs, properly so called. The *crocodi* and several true *lizards*, are without it—as the serpents; indeed, many contend that what considered as a urinary bladder in the abo mentioned animals is not actually so.

(d) *Fishes.*—Some of the genera and spec of this class are possessed of an urinary bladd The glandulæ suprarenales are wanting in fish

83. Of the External Integuments.

(a) *Mammalia.*—The cutis of this class var very much in thickness. In the wing of a it is extremely thin and delicate, and enormou thick in the *rhinoceros*, *elephant*, &c.

The rete mucosum varies in individuals ev of the same species. The skin itself is of va unequal thickness in particular parts of the sa animal. Hairs are common to all adult ma malia. These are commonly cylindrical; som however, are broad, with two sharp edg Others, as the whiskers of the *seal*, are also fl

but have rounded and denticulated margins. Some are thick and firm, but perforated by a narrow tube, as the long stiff whiskers of the *phoca ursina*.

(B) *Birds.*—The integuments of these have the same three parts as those of the mammalia; but the universal and peculiar covering of this class is feather, and the particular differences in its formation are innumerable.

(C) *Amphibia.*—The integuments of this class consist of shields, rings, scales, or simple skin, all covered externally by a cuticle, which in many of these animals, as in the *snake*, is frequently separated. The skin, indeed, of the *toad* and *frog* does not everywhere adhere, but is only attached at a few points.

(D) *Fishes.*—Scales are the peculiar coverings of this class, which are bare in those that inhabit the open sea, but are covered with a mucous membrane in those which live on coasts or in fresh water. The scales are not changed like hair and feathers, but are perennial, and are said to receive yearly an additional layer. The colour of the skin in some fishes, as in the *mullet*, depends upon the liver.

84. Organs of Peculiar Secretions.

(A) *Mammalia.*—In the orbit of the *dog* there is a gland found, which opens by an excretory duct near the last tooth of the upper jaw. The *elephant* has a gland at the temple, which secretes in the rutting season a brownish juice. Several ruminating *bisulca* have sebaceous *sinuses* near the lachrymal passages; and in most of the ruminantia there are cavities in the groins containing a sebaceous substance. Some of the mammalia have pouches on the abdomen: of this kind are the bags near the anus of the *badger*; and those peculiar glands and bags at the end of the rectum giving often to the excrement a musk-like odour. Other glands are connected with the genitals. There are in some of the ruminantia, excretory ducts opening at the extremities of the toes, from glandular cavities that are covered internally with hair.

(B) *Birds.*—Some birds have considerable *salivary glands* at the sides of the lower mandible. In those birds of prey that do not drink, the *pancreas* is of very considerable magnitude. The glands which secrete the oil in the upper part of the tail, are largest in aquatic birds.

(C) *Amphibia.*—These, many of them, have *anal glands*, disseminating a strong odour; and some reptiles, when they are irritated, as in the *salamander* and *toad*, exude through numerous pores in the skin an acrid fluid.

(D) *Fishes.*—Canals, which secrete a mucus, lie near the *lateral lines* of these animals, and either perforate the scales, or pour out a mucus in the intervals of the scales.

(D) *Insects.*—Silk is formed by the larvæ of phalenæ, and several hymenopterous and apterous insects secrete a poison, which is formed in a peculiar bag in those insects which have stings, which bag sends a duct to the skin. The wax prepared by the honey-bee, and by Indian *coccus mellificus* are of course peculiar secretions, resulting from peculiar structure.

(E) *Vermes.*—The formation of calcareous matter in the testacea takes place in a peculiar viscus lying near the heart. Some marine genera have a particular structure for the formation of the celebrated purple colour. Some of the bivalves, under extraordinary circumstances, form pearls on the inner surface of their shells.

For a more particular account of the peculiarities of structure and function, see Physiology under the head of *Secretion*.

85. Of the Heart and Blood-vessels.

(A) *Mammalia.*—The internal structure of the heart is the same as in man, but its situation is more perpendicular. Where the aorta arises from the left ventricle, there are two small bones, in the adult bisulca, and in the pig. A tuberosity in some of the vessels has been remarked in the common and sea-otters, and in the dolphin, &c.; and the rete mirabile, formed by the internal carotid at its entrance into the cranium, in several ruminating bisulca is remarkable. In the slow moving animals, there is a particular division of the arteries in the arms and thighs.

(B). *Birds.*—The right ventricle of the heart is provided in these animals with a strong muscle, instead of a membranous valve, as in the ventricles of the mammalia.

(C) *Amphibia.*—*Frogs*, *lizards*, and *serpents* have a simple heart consisting of a single ventricle and auricle. The *turtle* has a heart with two auricles, but they both communicate together, and the large arterial trunks arise altogether from the right ventricle only. The aorta, forming three grand trunks, is situated towards the right side and upper part; the pulmonary artery comes as it were from a particular dilatation which is not situated in the middle of the bases of the heart, but lower. In the article Physiology we shall have to advert to functional peculiarities as connected with structure, and in the present treatise, we abstain from so doing as much as possible.

(D) *Fishes.*—The heart of these animals consists of a single auricle and ventricle. The ventricle gives rise to a single arterial trunk which goes straight forward to the *branchæ* or organs of respiration. The blood passes from these into a large artery analogous to the aorta, which goes along the spine and supplies the body of the animal. It is then returned by the venæ cavæ into the auricle.

(E) *Insects.*—In the genus *cancer* and *monoculus* a heart and system of vessels are found; but there seems to be no passage of the arterial extremities into the origin of veins.

(F) *Vermes.*—In the *mollusca* and *testacea* there is a manifest heart, but no discoverable connection between arteries and veins.

86. Of the Absorbing Vessels.

(A) *Mammalia.*—All the parts of that system of vessels which has been commonly considered the absorbent system exist in this class. In dogs, and some of the other quadrupeds, the thoracic duct is double. In many mammalia the mesenteric glands are connected into one mass, constituting what has been improperly called *pancreas agellii*.

(B) *Birds.*—The thoracic duct is double in this class. The chyliferous vessels are only dis-

tinguishable from the common lymphatics by their situation and office, the chyle being transparent. There are no glands in the mesentery.

(c) *Amphibia.*—Thoracic duct double. There do not seem to be any lymphatic glands.

(d) *Fishes.*—The lymphatics are also destitute of glands and valves. Thoracic duct double.

87. Of the Organs of Respiration.

(a) *Mammalia.*—The lungs of quadrupeds are nearly like the human; but in the cetacea, and in the web-footed mammalia, they are not divided into lobes.

(b) *Birds.*—The lungs themselves are small, and they are, in fact, on the outside of the thoracic cavity; a great part of that cavity, as well as that of the abdomen, is occupied by membraneous air cells, communicating with the lungs and trachea; and there are large tubes in the cylindrical bones, and a reticulated texture in the broad ones, communicating also with the lungs in a great measure, but not universally. Some birds have a very large bill, which is likewise filled with air in its interstices, and the tubes of their quills also contain air which can be filled or emptied at pleasure.

(c). *Amphibia.*—The lungs of the amphibia are large in size, and loose in texture. In the chamæleon they have numerous projecting processes; and terminate behind in an elongated bladder in the newt. Serpents in general have only a single lung. In the tadpole, and the young of such lizards as bring forth in water, there are two organs which somewhat resemble the gills of a fish; and there is a canal on the left side of the head, near the eye, with which some tadpoles are furnished for discharging the water they take in at the mouth.

(d) *Fishes.*—This class of animals is furnished with gills or branchæ in the place of lungs; they are connected with the throat, and the water which is taken in is afterwards discharged through branchial apertures provided for the purpose. Many animals of this order possess a single or double swimming bladder, which is placed in the abdomen, and closely attached to the spine; it communicates generally with the œsophagus, and sometimes with the stomach, by a canal called *ductus pneumaticus.*

(e) *Insects.*—No white-blooded animals seem to take in air through the mouth. Many aquatic insects have gills near the attachments of their legs. Most others are furnished with air-vessels which ramify over most parts of their body. In the larvæ of insects these tracheal tubes are much larger and more numerous.

(f) *Vermes.*—Some of this tribe, as the *cuttle-fish, oyster,* &c. have a species of gills. But the greatest number have air-vessels like the insects. Some orders of this class, as the zoophytes, appear to be entirely destitute of any respiratory organs; so that if any function analogous to respiration is exercised, it must be by an unknown structure.

88. Of the Organ of Voice.

(a) *Mammalia.*—The greater number of animals of this class have the rima glottidis, provided with an epiglottis, which in most instances has a peculiar muscle arising from the os hyoides, and not found in the human subject; the margins of this rima are formed by the double ligament glottidis; between which the ventriculi laryngis are formed. There are certain dense membranes peculiar to these parts in some animals, and in others peculiar cavities opening into the larynx, and sometimes appearing as continuations of the ventriculi laryngis. Some of the cercopitheci, as the *C. Seniculus* and *beelzebub,* have the middle and anterior part of the os hyoides formed into a spherical bony cavity, enabling them to produce terrific and penetrating tones; these have been called the howling apes.

(b) *Birds.*—These possess what is called a double larynx, or more properly one divided into two parts placed at the upper and lower ends of the trachea. They have also two rimæ glottidis. They have no epiglottis, but there are conical papillæ placed at both sides of the rima. To the inferior or bronchial larynx there is a second rima glottidis formed by dense membranes, furnished externally with certain pairs of muscles, and with a kind of thyroid gland.

(c) *Amphibia.*—In some of the testudines the trachea forms different convolutions. It is very short in the frog. In all animals of this class ligamenta glottidis exist. The males of some frogs have peculiar membranous bags about the throat and cheeks. All the amphibia want the epiglottis.

89. Of the Brain and Nervous System.

(a) *Mammalia.*—The peculiarities which distinguish the brain of the human subject from that of all the other mammalia consist chiefly in the circumstance of its possessing a much greater bulk, in proportion to the nerves which arise from it; and in its being much larger in general, when compared with the cerebellum and spinal chord. The sandy matter which is found in the pineal gland has been hitherto observed in few mammalia besides man.

In the proper quadrupeds the anterior lobes of the brain form two large processes, from which the olfactory nerves proceed. The *corpora quadrigemina* and *candicantia* are different in the herbivorous from the carnivorous quadrupeds. The nates very considerably exceed the testes in size in the former class; while these proportions are reversed in the latter instance.

(b) *Birds.*—The brain differs from that of the mammalia in the smoothness of its surface, and in the optic thalami not being contained in the proper brain, but lying behind and below it.

(c) *Amphibia.*—Their brain is very small and simple, consisting of five roundish eminences. There is no appearance of arbor vitæ in the cerebellum; and the spinal marrow compared with the brain is of astonishing magnitude in most amphibia.

(d) *Fishes.*—The brain does not fill the cranium. Between the dura and pia mater there is a salt and greasy fluid contained in a loose cellular texture, which seems to supply the place of the tunica arachnoidea. In most cases the optic nerves decussate. The olfactory nerve some-

times forms a ganglion just before it is distributed to the nose. In the electric fishes nerves are sent from the fifth pair in the *torpedo*, from the spinal chord in the *gymnotus*, and from the eighth pair in the *silurus electricus* to membranous cells filled with gelatinous substance like the white of an egg.

(E) *Insects.*—The larvæ of insects have a brain consisting of two ganglia, contained in a horny cavity larger than itself; the nervous chord, constituting in the red-blooded animals the medulla spinalis, proceeds from this point along the abdomen, forming in its passage twelve simple ganglia, from which, and from the two ganglia constituting the brain, the nerves derive their origin.

(F) *Vermes.*—The structure and distribution of the nerves possess in many cases an analogy to those of insects. Those animals which inhabit corals, and the proper zoophytes are not possessed of an hitherto discoverable nervous organization.

90. Of the Organs of Sense.

I.—Of Touch.

(A) *Mammalia.*—In the quadrumana the structure of the organ of touch is more similar to that of man than any other of the class; the ends of their fingers, especially of the posterior extremities, are covered with as soft and delicately organized a skin as that which belongs to the human species; several of the *digitata* are probably provided with this sense. Bats have been supposed to be provided with a sixth sense, which gives a particular perceptibility to them, and is probably analogous to the sense of touch. The nerves of the wing are large and numerous, and distributed in a minute plexus between the integuments. The proboscis of the elephant has been supposed to have a peculiar susceptibility of touch, and the ornithorhyncus is said clearly to possess an organ of touch.

(B) *Birds.*—Geese and ducks, like the animal just mentioned, possess an organ of touch residing in a membrane investing their bills; this membrane being supplied with an abundance of nerves from all the three branches of the fifth pair.

(C) *Amphibia.*—Doubtful.

(D) *Fishes.*—Doubtful also, although several fishes seem to have an acute feeling on the abdomen and in the lips.

(E) *Insects.*—These probably are furnished with antennæ to give them a particular sensibility to the impression of external objects.

(F) *Vermes.*—That this sense resides in the tentacula of worms seems rather more doubtful.

II.—Of Taste. (Tongue.)

(A) *Mammalia.*—No animal possesses a tongue exactly like the human. In the simiæ it is longer and thinner, and has different papillæ. In the ant-eater and manis the tongue seems not to be an organ of taste, but merely subservient to the reception of food.

(B) *Birds.*—All kinds possess a tongue; it probably, however, serves in a very few genera as an organ of taste; in some cases it is horny and stiff, and not supplied with nerves; there is, however, great variety in the formation of the tongue of the bird tribe.

(C) *Amphibia.*—The tongue of the crocodile is small, and almost motionless. That of the salamander resembles this. Some of the testudines have a tongue covered with thick fibrous papillæ

(D) *Fishes.* It is doutful whether any of this class possess a tongue as an organ of taste.

(P) *Insects.* } both also doubtful.
(F) *Worms.* }

III.—Of Smelling. (Nostrils.)

This is a more extensive sense in the animal creation than that of taste; yet it is doubtful whether the two classes of white-blooded animals possess it.

(A) *Mammalia.*—The hedge-hog and mole, as well as the animals of the weasel, bear, dog, and cat kind, &c. have a very complicated formation of the ethmoid bone, and almost in this ratio is the acuteness of the smell. In the quadrumana, where such acuteness of this sense is not required, the ethmoid bone is remarkably narrow and imperfectly developed. The conchæ of the nares are very large in the bisulca and much convoluted in most animals of prey. The frontal sinuses of the elephant are exceedingly large, and the pig, which smells acutely, comes next in order in this respect. The blowing hole of the cetacea seems principally subservient to respiration.

(B) *Birds.*—These have no proper ethmoid bone, their olfactory nerves come directly through the orbits to the pituitary membrane of the nose.

(C) *Amphibia.*—In these the organ of smelling, as above intimated, does not seem clearly developed.

(D) *Fishes.*—Instead of *conchæ narium*, these animals possess a plaited membrane on which the olfactory nerves are distributed.

(E) *Insects.*—The organs by which these seem to distinguish odoriferous properties in bodies have not hitherto been detected.

(F) *Worms.*—The same remark applies to these.

IV.—Of Hearing (Ears.)

(A) *Mammalia.*—The four-footed mammalia are the only animals which possess true external ears, and even in these some of the parts are wanting. In those animals that go frequently under water, the external passage to the ear is furnished with a valve. Warm-blooded quadrupeds have the small bones of the ear like the human subject.

(B) *Birds.*—The apparent deficiency of external ear is compensated in birds, particularly in the rapacious tribe, by the regular arrangement of feathers round the opening of the meatus. Some have a valve at this part as the owls. They have a single *ossiculum auditus*. They have no *cochlea*.

(C) *Amphibia.*—Turtles, frogs, and most of the lizard kind, possess semicircular canals, a tympanum, and Eustachian tube. The crocodile is the only instance of an external meatus; and this animal has *ossicula*. The serpents, with but

few exceptions, have neither tympanum nor Eustachian tube.

(D) *Fishes.*—In the cartilaginous tribe there is a sort of rudiment of tympanum; but the other animals of the class have no similar part; their organ of hearing consisting of three large canals which usually project into the cranial cavity. The ear *grows* as the animal increases in size.

(E) *Insects.*—Their organ of hearing is very uncertain, though several of the tribe appear obviously to possess the faculty.

(F) *Vermes.*—It is only in the sepia that any thing like an organ of hearing has been discovered

94. V.—Of Sight. (Eye.)

(A) *Mammalia.*—The sclerotic coat of the eye in some of the mammalia, is not, as in man, of equal strength throughout. This structure influences the internal changes of the eye; and in some instances enables the animal to see at various distances, and in different media. The choroid coat consists more plainly in the cetacea than in any other mammalia of two distinct laminæ. Towards the back part of the eye this coat, in some of the carnivorous and predaceous animals is coloured with a brilliant yellow green and sapphire blue, forming what is called the *tapetum lucidum*. It is only partial.

This structure occasions less absorption of light. The iris exhibits exceedingly numerous varieties. There are great differences likewise in the corpus ciliare. No mammalia have the crystalline lens so slightly convex on the surface as the adult man. A *lachrymal gland* exists in all animals of this class; some have no *puncta*. The nictating membrane, of which only a rudiment exists in the quadrumana and man, is very large and moveable in some quadrupeds, especially in the elephant.

(B) *Birds.*—In birds of prey the eye has the form of the chalice used in the communion service; the cornea, which is exceedingly convex, forming the bottom of the cup, and the posterior segment of the sclerotica resembling its cover. A great peculiarity in the eye of birds is in the existence of the *marsupium*, which arises in the back part of the organs, proceeding apparently through a slit in the retina, and passing obliquely through the vitreous humour reaches, in some species, to the capsule of the lens. The nictating membrane of birds is furnished with two manifest muscles.

(C) *Amphibia.*—The green turtle (*testudo mydas*) possesses very large lachrymal glands, and a very moveable nictating membrane, in which circumstance the frog resembles them. In some reptiles and serpents, the common integuments form, instead of eyelids, a kind of firm window, behind which the eyeball has free motion.

(D) *Fishes.*—Their choroid coat and retina is plainly divisible into distinct lamina; and there is a body resembling a horseshoe lying between the external and middle layers of the choroid. A vascular membrane is common to the eyes of fishes, somewhat resembling the marsupium of birds.

(E) *Insects.*—Two kinds of eyes are found in insects, one small and simple, the other large and appearing like an aggregation of the smaller ones. Further investigation is required to shew how these eyes enable the insect to see.

(F) *Vermes.*—The cuttle-fish only, in this class, has been hitherto shewn to possess two eyes. In all other vermes the eyes are wanting, or their existence doubtful. Some have supposed the black point on the horns of the snail to be organs of vision.

95. Moving Organs. (Muscles.)

(A) *Mammalia.*—The smallness of the muscles on the calf of the leg, and on the buttock compared with that of man, constitute peculiarities here. The cutaneous muscular expansion of the trunk, and the *suspensorius oculi* exist in the mammalia, which are not of the *quadrumana* species. Some of the simiæ tribe of Linnæus, have extremely numerous muscles attached to the prehensile tails of the animal. The *glutæus maximus* of the horse, and the *gemellus* are remarkable.

(B) *Birds.*—The pectoral muscles of these animals are remarkably strong and large.

(C) *Amphibia.*—The muscles of those reptiles in which the trunk of the skeleton possesses but little mobility are very few. In the serpent tribe they are extremely numerous in connexion with the vertebræ and ribs.

(D) *Fishes* have muscles of a paler colour than those animals which have lungs for respiration, and their substance is generally destitute of tendinous fibres.

(E) *Insects.*—The number and bulk of their muscles is remarkable. Lyonet reckoned 4061 in the larva of the cossus, and 2186 of these belonging to the alimentary canal.

(F) *Vermes.*—Their arrangement of muscles bears considerable analogy to the larvæ of insects. Those which inhabit shells have peculiar muscles attached to their testaceous covering. In the *mollusca nuda*, and in the zoophytes, a remarkable power exists of shortening the whole body at once. In the gelatinous parenchyma of the latter no muscular fibres can, however, be distinguished.

96. Generative Organs. (Male.)

(A) *Mammalia.*—A scrotum is not common to all the genera. This is not found in the aquatic animals of this class, nor in the perfect subterranea. In several quadrupeds, as the dog, horse, ram, and others, there is a body lying according to the axis of the testicle, and called the *corpus Highmori*. It is not a canal. Most of the mammalia have *vesiculæ seminales*; they do not, however, exist in the dog or cat kind; nor in bears, opossums, sea-otters, seals, &c. The prostate is common and peculiar to the mammalia. In some species the penis consists of a single *corpus cavernosum*, without any septum. Some possess a peculiar bone in the penis. In some few, the passage conducting the urine and prostatic secretion, is distinct from the passage for the semen. In some species, the male penis while unerected turns backward, so that the urine is voided in the same direction as in the female.

(B) *Birds.*—The testes, which lie near the kidneys, and the *ductus deferens*, are the only male

organs which are constantly found in the whole class. Instead of a penis most birds have in the cloaca two small papillæ, on which the seminal ducts terminate. Some few species have a simple penis of considerable length, which is ordinarily concealed, and contracted within the cloaca.

(c) *Amphibia.*—The kidney, testes, and epididymis, lie close together in the testudines; these appear to have no vesiculæ seminales. Frogs have large vesiculæ seminales, and a small papilla in the cloaca instead of a penis. Crocodiles have a simple penis; lizards have two: the water-newt has no organ of this kind. Serpents have longer and broader testicles; no vesiculæ seminales, but a double penis.

(d) *Fishes.*—In the cartilaginous fishes there are manifest testicles, consisting partly of innumerable glandular and granular bodies, and partly of a substance like the soft roe of bony fishes. They have also *vasa deferentia*, and a vesicula seminalis, which opens by a papilla into the rectum.

The soft roe supplies the place of testes in most of the bony fishes. Through the middle of this substance a ductus deferens passes, which opens behind into a kind of vesicula seminalis, and this terminates in the cloaca.

(e) *Insects.*—The generative organs of these animals exhibit great varieties of structure. In the moth of the silk-worms we distinguish testes, long *vasa deferentia*, even a kind of vesicula seminalis, and a considerable penis. In the *gryllus*, a species of locust, the large testicles, with their convoluted fasciculi of vessels, bear a close resemblance to the ovaries.

(f) *Vermes.*—The *ascaris lumbricoides*, (intestinal worm), has one testes, which, towards the posterior part of the animal, forms a large tube, which becomes connected with the penis, the last organ lying concealed near the tail. The male organs of the cuttle-fish contain, at the spawning season, several hundred small tubular seminal receptacles, which are expelled from the body in an entire state, when a spiral vessel, which they contain, together with the semen, bursts their thin anterior extremities, from which the semen escapes.

97. Generative Organs. (Female.)

98. (a) *Mammalia.*—Of the external organs the *clitoris* is found most invariably. A true *hymen* has never been found but in the human subject. The vagina of quadrupeds differs from the human in its direction, and in the structure of its internal surface; it lies in the same axis with the uterus, and its membrane is without those transverse plaits, which distinguish it in the human female. The uterus of the mammalia is not so thick as in the human female; that of the *simia sylvanus* approaches nearest to the human in this particular; the ovaria are in general of an oval form, in some instances the Fallopian tubes are convoluted upon each other in a kind of knob. The *fimbriæ* are sometimes shaped like a funnel, as in the rabbit.

(b) *Birds.*—In these the external opening of the genitals consists of a transverse slit behind the ossa pubis; this leads to the cloaca, into which open the rectum, the two ureters, the vagina, and the *bursa Fabricii*. The genital tube considerably resembles an intestine; in it, however, are three distinguishable parts; the vagina, the proper uterus, and the oviduct; the last terminating in the infundibulum. The ovarium lies under the liver; it resembles in appearance a bunch of grapes, and contains, in a young laying hen, about five hundred yolks, varying in size from a pin's head to their perfect magnitude.

(c) *Amphibia.*—The tortoise has a manifest clitoris lying in the cloaca. The uterus, oviduct, and ovarium, are considerably like the last class, but they are double. Frogs have a large uterus. Female serpents have double external openings of the genitals. Their ovaria are long and much convoluted.

(d) *Fishes.*—The torpedo has two uteri, communicating with the cloaca by a common vagina. The oviducts form one infundibulum. In the carp the generative organs are placed at the side of the intestines, liver, and swimming bladder, as far as the anus, occupying the same position as the soft roe of the male does.

(e) *Insects.*—The two large ovaria of the *gryllus* are connected together at their posterior extremities. In the silkworm moth the ovarium resembles four rows of pearls.

(f) *Vermes.*—The opening of the genitals in the female *ascaris lumbricoides* is situated near the middle of the body; it leads to a short canal which divides into two tubes, which gradually contract into two slender thread-like oviducts. In the cuttle-fish there are two ovaria, and a common tube leading to the anus. *Zoophytes* generate in a manner resembling the growth of buds and branches in trees; and have neither generative organs nor distinction of sex.

For information on the functions and process of generation in the respective animals, whose organs are above described, and on the mode in which animals sustain, as well as propagate, their young, the reader is referred to the article Physiology.

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ANATOMY, in chemistry, is used for the analysis of mixed bodies. In this sense the chemists sometimes call their art anatomia spagyrica, spagyrical anatomy. Accordingly they speak of the anatomy of vitriol, sulphur, &c.

ANATOMY OF PLANTS may be considered as a branch of comparative anatomy, otherwise called dendronatomy. The parts of plants which come under anatomical consideration are, the roots, wood, bark, pith, fruit, leaves, flowers, &c. The anatomy of vegetables is supported chiefly by the industry of Malpighi and Dr. Grew, though considerably promoted by Ruysch, who by a peculiar method of injection, produced skeletons or systems of vessels of fruit, leaves, and the like. Something of the same kind has also been done by Thummingius. Some make F. Fabri the father of this science; and allege that Malpighi took many of his discoveries from him. Dr. Highmore in his book of Generation, Dr. Sharrock on the propagation of plants, and Dr. Hook in his Micrographia, have also given some observations tending this way, though only collaterally.

ANATOMY is also used in a less proper sense, to denote the art of resolving compound bodies into simple ones. In this sense any kind of compound body may be considered as its object; that is, any wherein there are divers parts joined together; even the taking asunder an artificial, political, or moral being, may, in this sense, come under anatomy.

ANATOMY, is also used, figuratively, for an exact search or examination of the parts of a discourse, business, or the like: in which sense we say the anatomy of a book, a doctrine, or the like.

ANATONIDES or ANTONIDES, a Dutch apothecary, a native of Goes in Zealand, where he acquired the designation of Vander Goes, born in 1647. He was a man of reading and genius, who studied with avidity the best classical authors, some of whose works he translated. But is principally known by his poem in honour of the river that flows through Amsterdam, in which city his works were collected and published in 1714, in one quarto volume, just thirty years after his death. They consist of the poem above named, The Invasion of China, a tragedy, and a poetical effusion on the peace of 1667, entitled Bellona chained. For some time previous to his death he enjoyed a post at the Dutch admiralty board.

ANATORIA, in geography, a small town of Greece, anciently Tanagra.

ANATRESIS, in anatomy; from *ανα* and *τιτραω*, perforo; the operation of trepanning.

ANATRIPSIS; from *ανα* and *τριβω*, I wear; in ancient medicine, friction. It is sometimes written simply tripsis.

ANATRIS, in chemistry, mercury or quicksilver.

ANATRON. The scum which swims upon the molten glass in the furnace, sometimes called sal vitri, which, when taken off, melts in the air, and coagulates into common salt. It is also that salt which gathers upon the walls of vaults. Likewise the same with NATRON, which see. Anatron is also a compound salt, made of quicklime, alum, vitriol, common salt, and mire, used as a flux to promote the fusion and purification of metals. It is also used for the terra saracenica.

ANATROPE, *ανατροπη*; from *ανατρεπω*, to subvert; a subversion or relaxation of the stomach, attended with the loss of appetite, vomiting, and nausea.

ANATTOM, the most southern of the New Hebrides. It is of considerable height, with a hilly surface, and from thirty to thirty-six miles in circuit. Long. 170° 5′ E., lat. 20° 3. N.

ANATZARTHON, in ancient geography, an archiepiscopal see of Asia, under the patriarchate of Antioch.

ANAUA, or ANAVA, a city placed by Herodotus in Phyrgia, between the rivers Marsyas and Meander, but nearer their sources than their confluences. To the south-west of this city, and near it, was a lake, from which they obtained salt.

ANAUCHIDAS, *Αναυχιδας*, a native of Elis, and a famous wrestler, to whom a statue was erected. *Paus.* l. 5, c. 27.

ANAUDIA, among naturalists, denotes dumbness, or a want of the use of speech, differing from aphonia, as the former is owing to a defect in the nerves of the tongue, the latter in the nerves of the larynx.

ANAUDIA, in medicine, another name for catalepsis.

ANAVINGA, in botany, a genus of evergreens of a middle size, that grows in Malabar, in the East Indies, especially about Cochin. Its genric characters, according to La Marck, are, CAL. five oval, concave leaves, opening in a rose, and permanent; COR. none, but at the base of each foliola of the calyx are two short pedicles, somewhat hairy; STAM. ten, length of the calyx, with their filaments inserted alternately between the pedicles, on the base of the folioles of the calyx; ANTHERS, small, ovate, divided into two by a furrow, the ovary superior, globular, or oval; STYLE, short; STIGMA, a spherical head. The fruit is an oval or globular berry, marked by five slight channels, and containing ovate reddish seeds seeds in a pulp. There are two species: 1. A. lanceolata, with alternate leaves, lanceolated, slightly serrated, subpubescent beneath, with oval berries longer than the peduncle. 2. A. ovata, with alternate leaves, ovate, acuminated, and serrulate, and globuse berries equal to the peduncle. This is also called talana and admetha. The juice of the berries taken internally, excites sweat, cures malignant distempers, and keeps the body open. A decoction of the leaves in water is recommended as a bath, for pains in the joints.

ANAUMACHION; from *α*, negative, *ναυς*, a ship, and *μαχομαι*, I fight; in antiquity, the crime of refusing to serve in the fleet.

ANAURUS, or ANAUROS, in ancient geography, a river of Thessaly, having its source at the foot of Mount Pelion. It is supposed to derive its name from being undisturbed by the winds. Lucian, b 6. v. 369, thus describes it:—

Quique nec humentes nebulas, nec rore madentem
Aera, nec tenues ventos suspirat Anauros.

ANAX, in ancient writers, a hero, or demigod. The word seems formed of the Hebrew anakim, or enakim, which has the same signification. According to Cicero the three eldest sons of Jupiter, called Διοσκοροι, were also named anaces.

ANAXAGORAS, one of the most celebrated philosophers of antiquity, was born at Clazomene in Ionia, in the first year of the 70th Olympiad. He committed his patrimony to the care of a relation, to be more at leisure for the study of philosophy, and placed himself under the care of Anaximenes at Miletus. When about twenty years of age he went to Athens, where he remained thirty years. Having assumed the character of a teacher of philosophy, he quickly rose to the highest eminence; and it is said, that among his scholars were Euripides, Pericles, and the renowned Socrates. After having for some time been persecuted for his opinions with regard to the substance of the sun, which interfered with the vulgar notion of the divinity of Apollo, he was condemned to death; but, through the influence of Pericles, the sentence was changed to banishment. He now took up his residence at Lampsacus, where he spent the remainder of his days, teaching philosophy in the school of his deceased master Anaximenes, and died here in the year 428 B.C.

ANAXAGORIA, in antiquity, a festival observed in honour of Anaxagoras, who dying at Lampsacus, the magistrates of that city asked him in what manner he desired his memory to be honoured: he replied, that on the anniversary of his death he wished the boys should have a holiday.

ANAXANDRIDES, king of Sparta, commenced his reign about 550 B.C. The ephori wished him to put away his wife on account of her barrenness, but he retained her out of affection, and took another who bore him children. His first wife afterwards became the mother of Doriæus, Leonidas, and Cleombrotus.

Anaxandrides, a comic poet of Rhodes, who flourished in the reign of Philip king of Macedonia, and was starved to death for satirizing the Athenian government.

ANAXARCHUS, a philosopher of Abdera, and a follower of Democritus, highly esteemed by Alexander the Great. His end was equally tragical and heroic. Having fallen into the hands of Nicocreon, tyrant of Cyprus, he ordered him to be pounded alive in a mortar; whereupon our philosopher replied, 'Beat as thou wilt on the carcase of Anaxarchus, himself thou canst not hurt.' On this the tyrant threatened to cut out his tongue, whereupon the philosopher is said to have bit it off, and spit it at him.

ANAXARETE, in ancient mythology, a princess of the family of Teucer, who having rejected the addresses of Iphis, a youth of ignoble birth, he hung himself in despair at her door. She beheld him without any emotion, and was therefore changed into a stone.

ANAXILAS, or Anaxilaus, in ancient history, a Messenian, the king of Rhegium, who reigned with great justice, and died in the 76th Olympiad, A.C. 476. He left his children to the care of a faithful slave, whom the people obeyed out of regard to his memory, until the sons had reached manhood, when, according to Diodorus, they were deposed in order to make way for a republic.

ANAXIMANDER, a famous Greek philosopher, born at Miletus in the 42d Olympiad. He was the first who publicly taught philosophy, or wrote upon philosophical subjects. It is said that he discovered the obliquity of the zodiac, was the first who published a geographical table and map of the world, and set up the first sundial. He died B.C. 547.

ANAXIMANDRIANS, the followers of Anaximander. Also denominated hylopathii, and opposed to the atomists.

ANAXIMENES, an eminent Greek philosopher, born at Miletus, the friend, scholar, and successor of Anaximander, and master of Anaxagoras. He diffused some light upon the obscurity of his master's system, and made the first principle of things to consist in the air, which he considered as infinite, and to which he ascribed a perpetual motion. He asserted that all things which proceeded from it were definite and circumscribed; and that this air was the Deity, since the divine power resided in it and agitated it.

Anaximenes, the son of Aristocles of Lampsacus, an orator, the disciple of Diogenes the Cynic, and of Zoilus the hypercritic on Homer. He was preceptor to Alexander of Macedon, and followed him to the wars. Alexander being incensed against the people of Lampsacus, they sent this philosopher to intercede for them; when the king, knowing the cause of his coming, swore that he would do the very reverse of whatever he desired. Anaximenes begged him to burn Lampsacus and extirpate the inhabitants; upon which Alexander pardoned the whole of them.

ANAXYRIDES, a sort of drawers, worn by the Scythians. The name, according to Hippocrates, is derived from αναστρω, to draw up.

ANAZARBA, or Anazarbus, a town of Cilicia, on the river Pyramus, the birth-place of Dioscorides and of the poet Oppian. It was afterwards called Cæsarea in honour of Augustus, and Justinea in honour of Justinian. This town struck medals of M. Aurelius, L. Verus, Commodus, Caracalla, Julia Paula, Alexander Severus, Maximinus, Maximus, Gordianus Pius, Trajanus Decius, Herennius Etruxus, Volusianus, Valerianus sen., and Gallienus. It was destroyed by a dreadful earthquake in the year 525, together with several other cities; which were repaired at a vast expense by the emperor Justinian.

ANBAR, a town of Asiatic Turkey, in Irak Arabi, seated on the Euphrates, fifty miles west of Bagdad.

ANBERTKEND, (the cistern of the water of life,) a celebrated book of the Brahmins wherein the Indian religion and philosophy are contained. It is divided into fifty beths, or discourses, each consisting of ten chapters. It has been translated into Arabic under the title of Morat al Maani, i.e. the marrow of intelligence.

ANBLATUM, in botany, the Linnæan name of a genus of plants belonging to the class and order Monœcia Monadelphia. The male calyx is a three-leaved perianthium; there is no corolla; the stamina are three filaments, united into a column, with simple antheræ. The female calyx is a three-leaved perianthium; there is no corolla; the pistillum is a germen, with three styles, and a simple stigma; the pericarpium is a capsule with three cells; the seeds are solitary. There is one species, a native of the East Indies.

ANCÆUS, in heathen mythology, the son of Lycurgus and Antinoe, one of the Argonauts who perished in the chase of the Caledonian boar.

ANCÆUS, son of Neptune and Astypalæa, a native of Samos, and an Argonaut. He was once told by one of his servants, whom he pressed with hard labour in his vineyard, that he never would taste of the produce of his vines. No sooner had he got the cup into his hand, and had called for the prophet to convince him of his falsehood, than he was informed that a wild boar was in his vineyard, upon which he threw down the cup and went in pursuit of it, in which he was killed; whence the proverb,

Πολλὰ μεταξὺ πέλει κύλικος καὶ χείλεος ἄκρου.

According to Horace:

Multa cadunt inter calicem supremaque labia.

ANCÆUS, in entomology, a species of papilio found in India, the papilio obrinus of Fabricius.

ANCARANO, a town of Italy, in the papal territory and marq. of Ancona, situated five miles north of Ascoli, and eighty-two north-east of Rome. Lon. 13° 29′ E. lat. 42° 48′ N.

ANCASTER, Sax. from an, and ceaster, a castle; a town in Lincolnshire, under a hill, eight miles from Grantham, and 115 north of London. It was called Croceocalana by the Romans, and situated on the Roman highway. There are some stone quarries in the neighbourhood.

ANCENIS, a town of France, seated on the Loire, in the department of Lower Loire, twenty miles east of Nantz.

ANCEPS, in botany, an epithet for a stem and a leaf, which has both its edges sharp.

ANCEPS, in conchology, according to Gmelin, a species of patella.

AN'CESTOR, AN'CESTRY, AN'CESTRAL. *Ante*, before; *cedo*, *cessum*, to go. One who goes before in order of time, and from whom we descend by birth and lineage.

His purpos was for to bestowe hire hie,
Into som worthy blood of *ancestrie*.
Chaucer. The Reeve's Tale, vol. i. p. 157.

That lords do lacke their *auncestors* good wil,
That knights consume their patrimonie still.
Gascoigne.

In thy great volume of eternitye;
Begin, O Clio, and recount from hence
My Glorious Soveraines goodly *auncestrye*,
Till that by dew degrees and long portense,
Thou have it lastly brought unto her Excellence.
Spenser's Faerie Queene, book iii. c. 3.

When we have done our *ancestors* no shame,
But serv'd our friends, and well secur'd our fame,
Then should we wish our happy life to close,
And leave no more for Fortune to dispose.
Dryden's Palamon and Arcite, book iii.

Title and *ancestry* render a good man more illustrious, but an ill one more contemptible. *Addison.*

If a man could bequeath his virtues by will, and settle his sense and learning upon his heirs, as certainly as he can his lands, a brave *ancestor* would be a mighty privilege. *Collier.*

ANCESTORS. Most nations have paid honours to their ancestors. The custom of embalming among the Egyptians, and enclosing the body afterwards in wood, when it was lodged in an appointed place in the walls of the principal houses, is mentioned by Herodotus in the Euterpe; and was a species of honour paid to ancestors. The primitive Greeks (Plato Minoe) seem to have followed this custom of preserving their ancestry about them, so far as to bury them generally in some part of their houses. The Thebans had an ancient law, that no person should erect a house without including in it a repository of this kind.

Philo Byblius, the translator of Sanchoniathon's History of the Gods, states, that the Phœnicians and Egyptians, from whom other people derived this custom, reckoned those amongst the greatest gods who had been the benefactors of the human race; and that to them they erected pillars and statues, and dedicated sacred festivals. (Euseb. Præp. Ev. lib. i. cap. 9.) We need not, therefore, be surprised to find that, as a part of this system, all the heroes of antiquity, in due time, were not only gods, or demi-gods after death, but of divine ancestry.

It was properly the departed souls of their forefathers that the Romans worshipped under the denomination of lares, lemures, and household gods. Hence the ancient tombs were a kind of temples, or rather altars, wherein oblations were made by the kindred of the deceased

The Russians have still anniversary feasts in memory of their ancestors, which they call roditoli sabot, q. d. kinsfolks' sabbath, wherein they make formal visits to the dead in their graves, and carry them provisions, eatables, and presents of other kinds.

But the Chinese have distinguished themselves above all other nations, in the veneration they bear their ancestors By the laws of Confucius, part of the duty which children owe their parents consists in worshipping them when dead. This service, which makes a considerable part of the religion of the Chinese, is said to have been instituted by the emperor Kun, the fifth in order from the foundation of that ancient empire. Every family of rank has a temple to the memory of its ancestry; and on the sudden elevation of any member of the community to new wealth, before he builds a palace for himself, he is directed by the lee-kee to be careful to erect and dedicate a mausoleum to the honour of his ancestors. In almost every house, says Sir G. Staunton, is hung up a table of the ancestors of the persons then residing in it. References are afterwards made in conversation to their actions. Their example, as far as it was good, serves as an incitement to travel in the same path. The descendants from a common stock visit the tombs of their forefathers together at stated times. This joint care, and indeed other occasions, collect and unite the most remote relations. The child is bound to labour, and to provide for his parents' maintenance and comfort; and the brother for the brothers and sisters, that are in extreme want: the failure of which duty would be followed by such detestation, that it is not necessary to enforce it by any positive law. *Embassy to China*

In English law a distinction is made between

the ancestor as a natural antecessor, and a predecessor in an office or dignity. Thus in the church of England, and in bodies corporate, there are no ancestors, but predecessors.

Some original and excellent remarks have appeared in a late number of the Edinburgh Review, on the subject of *extreme* deference to the opinion of our ancestors. We are far from thinking lightly of the respect that is due to most maxims, and even prejudices that have been sanctioned by the concurrent judgment of successive ages; but there is much matter-of-fact truth in the following observations. Experience is certainly the mother of wisdom, and the old have, of course, a greater experience than the young; but the question is, Who are the old? and Who are the young? Of *individuals* living at the same period, the eldest has, of course, the greatest experience; but among *generations* of men the reverse of this is true. Those who come first (our ancestors) are the young people, and have the least experience. We have added to their experience the experience of many centuries; and, therefore, as far as experience goes, are wiser and more capable of forming an opinion than they were. The real feeling should be not, can we be so presumptuous as to put our opinions in opposition to those of our ancestors? but can such young, ignorant, inexperienced persons, as our ancestors necessarily were, be expected to have understood a subject as well as those who have seen so much more, lived so much longer, and enjoyed the experience of so many centuries? All this cant then about our ancestors is merely an abuse of words, by transferring phrases true of contemporary men to succeeding ages. Whereas (as we have before observed) of living men the oldest has, *cæteris paribus*, the most experience; of generations, the youngest has *cæteris paribus*, the least experience. Our ancestors, up to the conquest, were children in arms; chubby boys in the time of Edward I.; striplings under Elizabeth; men in the reign of queen Anne; and *we* only are the white-bearded, silver-headed ancients—who have treasured up, and are prepared to profit by, all the experience which human life can supply. We are not disputing with our ancestors the palm of talent, in which they may or may not be our superiors, but the palm of experience, in which *it is* utterly impossible they can be our superiors! *Edin. Rev.* No. 84.

ANCHE, in music, a reed; also the mouthpiece of a clarinet, and that part of the hautboy or bassoon, to which the reed is attached.

ANCHER (Peter Kofod), a Danish lawyer of the eighteenth century, the author of many elementary works on the civil and criminal law of Denmark; the most celebrated of which is, the History of Danish Law, from the Time of Harold to that of Christian V, 3 vols. 8vo. 1769.

ANCHIALE, in ancient geography, Αγχιαλη, Αγχιαλεια, or Αγχιαλος, a town of Cilicia, built, according to Strabo and most authors, by Sardanapalus; but according to Stephanus, on the authority of Artemidorus, by Anchiala daughter of Japetus.

ANCHILOPS (αγκυλη, contraction, and ωψ, eye,) in medicine, denotes an abscess, or collection of matter in the lachrymal sac between the great angle of the eye and the nose. If suffered to remain too long, an ulcer is produced. When the tumor is broken, and the tears flow involuntarily, whilst the os lacrymale is not carious, it is an ægylops; but when the ulcer is of a long standing, deep, fetid, and the os lacrymale becomes carious, it is a fistula. The cure is effected by restriction and excision, tying it at the root on the glandula lacrymalis, and when ready, cutting it off.

ANCHIROMACHUS, in middle-age writers, denotes a kind of vessel, which on account of its swift sailing was used for the conveyance of anchors, and other necessary utensils of ships.

ANCHISES, in fabulous history, a Trojan prince, the son of Capys, and descended from Dardanus. Venus made love to him in the form of a beautiful nymph, and bore to him Æneas, the hero of Virgil's Æneid. According to Virgil Æneas took his father on his shoulders and made his escape with him the night on which Troy was taken. The time of his death is much disputed; according to Virgil he died in Sicily, and was buried in mount Eryx, by Æneas and Anchises king of the country.

ANCHISES, in entomology, a species of papilio found in America.

AN'CHOR, *v.* & *n.* } Anchora, αγκυρα, from
AN'CHORABLE, } αγκη, a hook or crook.
AN'CHORAGE, } To connect by means
AN'CHORED. } of an instrument, generally of iron, with branches curved and pointed. To fasten; to secure; to hold fast; to obtain stability; to preserve in safety.

> Yon eyes that wonted were
> Light louing lookes to cast,
> I give commandment on hir hue
> That he be *ankred* fast. *Turberville.*

> From pole to pole she her acts resound,
> And rules an empire by no ocean bound;
> Knows her ships *anchor'd* and her sails unfurl'd
> In other Indies, and a second world.
> *Prior's Solomon*, book i.

A great stone that I happened to find after a long search by the sea-shore served me for an *anchor*. *Gulliver's Travels*, part I. chap. viii.

Having looked aloft while he was speaking, he observed that the wind for which he had waited began to blow, he therefore gave orders instantly to weigh *anchor*; the sails were spread to the breeze, and the oars divided the flood. *Hawkesworth's Telemachus.*

> Roused from repose, aloft the sailors swarm,
> And with their levers soon the windlass arm:
> The order given, up springing with a bound,
> They fix the bars, and heave the windlass round,
> At every turn the changing pauls resound:
> Up-torn reluctant from its oozy cave
> The pond'rous *anchor* rises o'er the wave.
> *Falconer's Shipwreck.*

> The race of life becomes a hopeless flight
> To those who walk in darkness: on the sea
> The boldest steer but where their ports invite;
> But there are wanderers o'er Eternity
> Whose bark drives on and on, and *anchor'd* ne'er
> shall be. *Lord Byron's Childe Harold.*

Hope, as an *anchor* firm and sure, holds fast
The Christian vessel and defies the blast.
Cowper

Anchor, in navigation, is an important strong and heavy instrument of iron, consisting of a shank having at one end a ring to which the cable is fastened, and at the other end two arms, or flukes, with barbs or edges on each side. It is carried on the bows of ships for the purpose of fixing and retaining the vessel in harbour, or in some place of safety where the depth of the water does not prevent the possibility of its being employed.

The anchor is of very ancient use. The invention of it is ascribed by Pliny, lib. 8. c. ult. to the Tuscans, and by Pausanias, Attic. lib. i. c. 4. p. 12, to Midas, the son of Gordius, who built the city of Ancyra. The use of it must have been nearly coeval with navigation itself. The most ancient anchors were of stone, and sometimes of wood, to which was attached a quantity of lead, or some other ponderous substance; but, as the science of navigation became improved, anchors were constructed of iron furnished with teeth or flukes, which, fastening to the bottom of the sea, might serve to keep the vessel from being driven away; hence *οδοντες*, teeth, are used for anchors.

The first anchors had a fluke on one side only, whence they were called *ετεροσομοι*. Eupalamus, according to Pliny, was the first who made them fluked both ways; or, according to Strabo, lib. 7. ex Ephor. tom. p. 464, the second tooth or fluke was added by Anacharsis the Scythian. Thus two-fluked anchors were called *αμφιβολοι* or *αμφιτομοι*. Every ship had several anchors, the largest of which was called *ιερα*, sacred, and was never used but in extreme danger; whence the phrase 'Sacram anchoram solvere' is a proverb applied to such as are reduced to their last refuge. Anchors might be made with one arm, in which case they would be lighter, and in fine weather would hold equally firm. The reason of having two arms is, that it may always take hold, in order to which it is necessary it should be made heavier. The present form of the anchor has this peculiar advantage, that falling to the bottom of the sea it so deposits itself in the earth, that any force acting nearly horizontally upon it, would rather root it deeper than detach it from its bed, its form providing it with a hold twenty times as great as could be obtained from its weight alone. The manner in which the anchor operates will be best understood from fig. 1, Anchors, where it is evident the anchor cannot be moved without ploughing up the ground in which it is embedded, an operation which is called dragging the anchor; but when the anchorage is good, the hold is so strong that the cable may rather be expected to part, or the buried anchor to be ruptured, than any dragging of this kind to occur. There are various kinds of anchors, differently denominated according to their sizes and use. Those used in large ships are generally of the form shown in fig. 1, and are distinguished into sheet, best-bower, small-bower, spare, stream, and kedge anchors. In ships of war the sheet anchor is stowed upon the after part of the fore channel, on the larboard side, with the stock vertical, and one of the flukes resting on the gangway. The bower hangs to the cathead with the extremity fixed to the anchor boards, and the spare anchor is stowed away on the starboard fore channel. Ships of the first class carry seven anchors, and smaller vessels, as brigs, cutters, and schooners, only three. Stream and kedge anchors are smaller than those just-mentioned; and the latter of these is composed of an iron stock passing through a hole in the shank, and preserved by a forelock. In the East Indies, to secure what they call grab vessels, a peculiar kind of anchor is employed, technically called the mushroom anchor, from its resemblance to that vegetable: see the annexed diagram.

Its form dispenses with the necessity of a stock, since fall in what direction it may it is sure to attach itself to the bottom. Small European vessels employ what are technically called grapnels, see fig. 2, which have all the advantages of the anchor last described. Two improvements in this useful instrument have lately attracted considerable attention. The first is an invention of Mr. Stuard, exhibited in fig. 3, and requires but one arm, the shortness and ponderosity of which insures its success. The second, which is an invention of Mr. Kingston of Portsmouth, is very peculiar. The cable is not fastened to a ring, but, passing through the centre of the shank, is secured upon the crown of the anchor by a knot of greater diameter than the tube. This composition is of bell-metal, the upper extremity of the tube of the shank being widened, till it assumes a form similar to that of a trumpet.

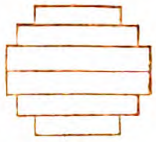
Mooring anchors are commonly employed in harbours, or other places where ships make their rendezvous, and are generally much larger than the common anchor; but in some cases the anchors of large ships are employed, dispensing with one fluke; and in others larger staves, having an iron ring fastened through their centre, as in the annexed diagram: several of these are sometimes secured together by a wooden frame. Mr. Hemman of Chatham invented a mooring anchor in 1809, which obtained a silver medal from the Society of Arts; see fig. 4. Mr. Brown of Woolwich invented a second form of this instrument; see fig. 5. Mr. Park of Portsmouth invented a third, which is exhibited in the following diagram: a floating anchor has long been thought a desideratum to prevent the driving of the ship before the wind and tide, when the depth of water renders it impracticable for the common anchor to be employed, which can only be effected by providing an anchor capable of so acting upon

the element as to maintain its position. Dr. Franklin's invention was two cross bars screwed in the middle, having sail-cloth fastened to them in the shape of a parallelogram; to the centre of these bars the cable was attached; and the machine being thrown overboard, he considered would, from the resistance it would meet with in the water, preserve the ship from being driven away. No machines of the kind, however, are carried by the royal navy.

The anchor now in general use is the one invented by Mr. Perring, clerk of the cheque at Plymouth. The parts of which it is composed are, A the shank, B the arm or fluke, C the palm, D the blade, E the square, F the nut, G the ring, and H the crown. See fig. 6.

The making of anchors is a point of great importance to the interests of seamen, whose lives in some situations depend upon the goodness of their anchor. It is on the ground of its importance that so great a degree of attention is bestowed upon it in the dock-yards of the royal navy.

In fabricating the shank it was formerly the practice to form it of square iron rods, disposed in the form of a cylinder, and encircled by other bars, which were wrought into the shape of parts of sectors of circles; from which formation it followed, that the mass could not be sufficiently welded to unite firmly the interior bars, without at the same time spoiling the quality of the exterior iron. This difficulty was obviated by Mr. Perring, by using bars of the whole breadth of the shank, see diagram, which are placed one upon another; and being kept in their positions by iron hoops, are welded together in two heats, until the whole is one compact body, which, by this arrangement of the bars or plates, is capable of being effected without overworking the iron. The crown is composed of bars similar in their disposition to those of the shank. The method of uniting the flukes to the crown is of very great importance, and accordingly much ingenuity has been bestowed upon it. The following is the most improved plan, and now generally adopted:—The bars being made but half the breadth of the anchor, are first separately welded, and then placed side by side, as exhibited in fig. 7. The upper half A is then wrought into one mass, the lower half B being left disunited, having two iron bars called porters *a a* attached to the extremity of each division of the end B. The part B is then heated, and placed in the machine as exhibited fig. 8, consisting of a frame of timber firmly faced with a strong iron plate, having four iron pins of considerable strength upon its surface, *b b c c*. Between *b b* the end A of the crown is placed and passed under the strap *c*. The divided extremity B is brought between the pins *c c*, the two parts are separated by means of the porters *a a*, and bent into the form exhibited in the figure; by which means part of each arm being formed out of the crown, a greater probability is afforded of their being united than could be obtained in any other way. The angular opening, *a a*, fig. 9, is filled up by the chock, formed of short iron bars placed vertically; and after this has been properly welded, the truss piece, *c c*, is placed over it, composed of plates similar to those mentioned before, the edges placed horizontally. The truss piece, being half the breadth of the arm, gives a considerable degree of strength and compactness, and makes, with the parts *c c*, the entire breadth at those places. After this has been done the shank is shut on the crown, the square formed, the nuts welded to the mass, the ring placed, and the shank wrought and completed according to the shape exhibited in fig. 6. The blade is commenced by bending an iron rod into the form *a b c*, fig. 10, fastening a porter to the extremity; iron plates are laid side by side upon the rod *a b c*; an additional plate is laid upon the middle; the mass is then wrought, and similar plates laid upon the lower side, after which the whole is completely welded. The blade is shut on the palm, the part of the arm attached to the blade joined to the part attached to the crown, when the iron work of the anchor is finished. The shutting in of the several parts of the anchor is performed by a mass of iron called the markey, raised to a certain height, and let fall upon the work in a welding heat; and also by the hercules, an instrument of a similar nature. Some time ago a plan was devised to perform these operations by steam, under tilt hammers, weighing five tons each, having an extreme fall of sixteen inches. Although the above is the usual mode of fabrication, other improvements have from time to time been proposed with different degrees of success. Mr. Brunton's plan, it is said, has not been fairly tried. It consists of forging the anchor without welding the arms to the shank, avoiding the danger of a bad joint. This is effected by making the arms in one piece, enlarging them at the crown, and piercing the part thus enlarged with a hole the size of the shank; the latter part of the anchor (the shank) is made with a shoulder at the extremity near the crown, in such a way that when the lower part is brought through the above-mentioned aperture, the arms bear upon the shoulders. From this construction it is evident, that to unite firmly the arms and the shank it is merely necessary to form the extremity of the latter sufficiently long to enable the smiths to rivet it on the lower end of the crown. The stock of the anchor consists of two solid pieces of oak, tapering from the middle to the extremities, and fastened across the beam near the ring; which serve, by their action upon the water in descending, to guide the flukes in a direction perpendicular to the surface of the ground; so that, as soon as the anchor falls, one of them sinks into the earth by its own weight, and is preserved in that situation by the stock, which, together with the shank, lies flat upon the bottom. For large anchors the side checks are usually made of two pieces of tree nailed together, fig. 11 and 12; great care is taken to secure the stocks to the anchor; and, in small anchors, as also in Mr. Stuard's anchor, the stocks are of iron. The following is a table of the most approved:—



DIMENSIONS OF ANCHOR-STOCKS.

	90 cwt.		70 cwt.		40 cwt.		18 cwt.		9 cwt.		7 cwt.	
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
Diameter at the middle	1	11	1	8	1	4½	1	0½	0	10	0	8½
——— at the ends	0	11½	0	10	0	8¼	0	6¼	0	5	0	4⅜
Opening between the cheeks in the middle	0	1½	0	1¼	0	1	0	1	0	0⅞	0	0⅞
Diameter of the bolts	0	1¼	0	1⅛	0	1	0	0¾	0	0¾	0	0¾
Hoops thick	0	0⅞	0	0¾	0	0⅝	0	0½	0	0½	0	0⅜
—— broad	0	3½	0	3¼	0	3	0	2½	0	2¼	0	2

Casting the anchor is the act of letting it down into the sea. The cable is ranged along the deckin longcoils, , one end being attached to the bits and the other to the ring of the anchor. The stock-lashing is cast off, the fastenings are removed, and the anchor falls into the sea. In riding at anchor the chief thing that requires attention is to see that the ship swings clear of other vessels, and that she does not get a foul hawse.

Weighing the anchor denotes the drawing it up from the bottom of the sea into the vessel; which, in small vessels, is done by means of a windlass; in large vessels, by means of a smaller rope, called the messenger, the cable being too bulky to admit of the application of the former mode. One end of the messenger being passed with several turns round the capstern, the other is taken forward, and put round the rollers at the fore part of the ship; it is again brought aft, and the two ends united; thus the rope, by the heaving of the capstern, will revolve perpetually round the rollers placed in the manger. The messenger is then attached to the cable, by means of short ropes called nippers, from one to two fathoms apart, and, by the efforts of the men upon the capstern, the latter is forced up by the operation of the former. As the cable approaches the capstern, the nippers are removed, and others placed further down it; and the cable, thus brought into the ship, is carried down the hatch-way, and, as it enters, is coiled within the cable tier. Should the cable be muddy, and the nippers not nip enough, sand or ashes are thrown on the cable. Large ships have a jeer as well as a main capstern, the operations of which are communicated by a viol, acting in the same way as the messenger, with the exception that it is passed through the viol block, which is lashed round the main mast; and that it acts on the midship side of the cable. When the anchor has been brought above water, the tackle is put upon the shank just within the flukes, the arms are placed upon the anchor-boards and gunnel, and the stock, made vertical, secured by the stock-lashing, &c. One end of the stopper is fastened round the cat-head, and the other brought through the ring, then turned over the stopper cleat, and is belayed round a timber head. The ring is finally fastened to the cat-head, and the operation is finished.

TABLE I.

Weights and Dimensions of the SHANK, SQUARE, and RING of ANCHORS in his Majesty's Navy.

Weights.	SHANK.								SQUARE.				RING.		
	Sizes.								Sizes.						
	Length.		Throat.		Trend.		Small.		Length.		Breadth at the nut.	Hole from end.	Extreme diameter.		Dia. of iron.
cwt. qrs. lbs.	ft.	in.	R in.	F in.	R in.	F in.	R in.	F in.	ft.	in.	R in. F in.	in.	D ft. in.	*d* ft. in.	in.
94 0 0	19	3	12¼	9¾	11½	9¼	9¼	7⅞	3	7½	9¼ 7⅞	6	3 2	2 10	4¾
90 3 0	18	5	11⅞	10¼	11⅝	10	9⅛	7½	3	6	10 8¼	8	3 2	2 10	4¾
73 3 0	17	0	11⅜	8⅞	11½	8½	8⅞	6⅞	3	1	8⅞ 7⅛	7	2 10½	2 8½	4⅛
49 2 0	15	7	9⅜	8⅛	8½	6⅝	7⅛	5⅝	2	0	7¼ 6	5	2 7	2 3½	3⅝
28 2 0	14	1	8¾	6¼	8⅛	5¾	6⅛	4¾	2	6	6½ 5	4⅜	2 0	1 10	3⅛
8 0 0	8	7½	5½	3⅞	5⅜	3⅜	4¼	3	2	1	4⅜ 3	4	1 4½		2¼
7 2 0	8	6½	5½	3⅞	5½	3½	4⅜	3	2	0	4½ 2⅞	4	1 4½		2¼
2 1 12	6	0	3⅞	2⅝	4	2½	2⅞	2	1	4	3½ 2⅛	2½	10½		1⅜

TABLE II.

WEIGHTS and DIMENSIONS of the ARMS, PALMS, &c. of ANCHORS.

Weights.	ARMS.					PALMS.				Dimensions at intervals of two feet from the crown.											
	Sizes.							Thickness.		2		4		6		8		10		12		14	
	Length.	Throat.		Small.		Length.	Breadth	Middle.	Edge.														
cwt. qrs. lbs.	ft. in.	R in.	F in.	R in.	F in.	ft. in.	ft. in.	in.	in.	R in.	F in.	R in.	F in.	R in.	F in.	R in.	F in.	R in.	F in.	R in.	F in.	R in.	F in.
94 0 0	6 4½	13⅛	9¾	10¾	8⅝	3 3¼	3 2	3⅜	2¼	12	9¾	11¼	9¾	11½	9½	11¼	9¼	10⅝	8⅝	10½	8	9¼	7⅞
90 3 0	6 2½	13	9¼	10⅛	8⅜	3 2	3 0½	3¼	2	11½	10⅛	11⅜	9½	11¼	9½	11¼	9¼	10¾	8¾	10	8¼	9	7½
73 3 0	6 0	11¾	8⅞	9¾	7⅝	3 0½	3 0½	2¾	1⅞	11¼	9	11¼	8¾	11¼	8¾	10⅜	8¾	9⅞	7⅝	9¼	7⅛	8⅞	6⅞
49 2 0	5 0	10¾	7⅞	8⅜	6⅞	2 7	2 7	2⅝	1⅞	7⅞	6	9½	7¼	8½	6⅝	7⅞	6¼	7½	6	7¼	5⅝		
28 2 0	4 4	9	6⅝	7	5⅜	2 0	2 0	2¼	1½	7⅞	6	8	5⅝	7⅞	5½	7⅛	5⅛	6⅜	4¾				
8 0 0	3 0	5¾	3⅞	4⅜	3⅛	1 6	1 5	1⅜	1	5½	3¼	5¼	3¼	4½	3								
7 2 0	3 0	5¾	3⅞	4⅜	3⅛	1 6	1 5	1⅜	1	5½	3⅛	5⅛	3¼	4⅜	3								
2 1 12	2 0	4⅛	2¾	3¾	2½	0 11½	0 11	7⅛	⅝	3⅜	2¼	3	2										

*** In the above Tables R and F denote the round and the flat of the anchor; the dimensions arranged under the first being taken in the direction of the greatest diameter, and those under the latter in the direction of the less. D and *d* are the diameters of the ring, which is not circular, but elliptical.

ANCHORS, or ARROWHEADS, in architecture are commonly placed as part of the enrichments of the boultins of capitals of the Tuscan, Doric, and Ionic orders, and also of the boultins of bed-mouldings of the Doric, Ionic, and Corinthian cornices, anchors and eggs being carved alternately, whence the echinus or ovolo itself is popularly called eggs and anchors.

ANCHORS, in heraldry, are emblems of hope, and are taken for such in a spiritual as well as a temporal sense, see the extracts under the word. In contrast with that from a late noble poet, our pious readers will remember with pleasure St. Paul's beautiful allusion to hope as 'an anchor of the soul,' Heb. vi. 19, 30: Socrates said 'To ground hope on a false supposition, is like trusting to a weak anchor;' and '*ουτε ναυν εξ ενος αγκυριον, ουτε βιον εχ μιας ελπιδος ορμειον*, a ship ought not to trust to one anchor, nor life to one hope.' Some of our best commentators have overlooked the Apostle's fine continuation of the metaphor in v. 20: 'Where a forerunner hath entered for us' (*προδρομος*). The 'vail' of the nineteenth is the supposed vail or screen of a harbour, as the break-water for instance at Plymouth. The Prodromos is one who goes before, with a boat or otherwise, to cast the anchor within that vail or inner road.

ANCHORA, in entomology, a species of cimex inhabiting Japan, and first discovered by professor Thunberg.

ANCHORAGE, in commerce,' the duty paid for liberty of anchoring in a port. It also signifies ground fit to hold a ship's anchor, so that she may ride safely. The best ground for a ship to anchor in is stiff clay, or hard sand; and the best riding at anchor is when a ship is landlocked, and out of the tide.

ANCHORAGO, in entomology, a species of the Fabrician genus brentus, Linnean circulio from which Gmelin removed it to the genus brentus. It is a native of India. Also a species of cimex inhabiting North America.

ANCHORALIS PROCESSUS, in anatomy, the same with processus covacoides.

ANCHOVY, from anchova, Spanish; or anchoi, Italian, of the same signification. The English name for the clupea encrasicolus, a fish much used by way of sauce, or seasoning. Scaliger describes the anchovy, as about the length of a finger, having a pointed snout, a wide mouth, no teeth, but gums as rough as a saw. The fishing is chiefly in the night time; when a light being put on the stern of the fishing vessels, the anchovies flock round and are caught in nets.

ANCHOVY PEAR, in botany, the fruit of a tree in the West Indies; the grias cauliflora of Linnæus. It is about the size of an alligator's egg, of a brown colour, and commonly used as a pickle.

ANCHUSA, ALCANET or BUGLOSS, in botany, a genus of the monogynia order and pentandria class of plants; in the natural method ranking under the forty-first order, asperifoliæ. CAL. a quinquepartite perianth, oblong and persistent: COR. monopetalous and funnel-shaped, the throat closed with scales: STAM. five short filaments: ANTHERÆ oblong and covered: PIST. four germina: STYL. filiform: STIGMA obtuse: PERICARP none; the calyx containing the seeds in its bosom: SEEDS four oblong, gibbous, and engraven at the base. There are eight species, al. of which may be propagateed by seeds. 1. A. angustifolia, or perennial wild borage, seldom more than a foot and a half high. 2. A. cretica, or warted bugloss of Crete, a low trailing annual plant, whose branches seldom extend more than six inches. The plants perish soon after their seeds are ripe. 3. A. officinalis, or greater garden bugloss, a native of France and of the warmer parts of Europe: grows well in Britain. 4. A. orientalis, or eastern bugloss, a native of the Levant, but will grow in the open air in Britain if it has a dry sandy soil. It is a perennial plant, with long trailing branches. 5. A. sempervirens, or ever-green borage, is a very hardy perennial plant, with weak trailing branches. It grows naturally in some parts of Britain and Spain. 6. A. tinctoria, or true alkanet, grows naturally in the Levant, but is equally hardy with the orientalis. 7. A. Virginica, or puccoon, a native of North America. 8. A. undulata, or Portugal bugloss, a biennial plant, which grows to the height of two feet, and sends out many lateral branches. The flowers of the A. officinalis have obtained the name of cordial flowers, as they are cooling and softening as a medicine. The root of the tinctoria affords an elegant red colour to oily substances, and is frequently a colouring ingredient in ointments, plasters, &c. The small roots are to be preferred, as having proportionably more bark than the large ones. The alkanet root which grows in England is greatly inferior to what comes from abroad.

ANCHYLOBLEPHARON, or ANCYLOBLEPHARON, from *αγκυλος*, bent, and *βλεφαρον*, the eye-lid: a distemper of the eye-lids, wherein they sometimes cohere to each other, and sometimes to the ball of the eye itself. It is a disorder sometimes brought with an infant into the world, and is always dangerous and difficult of cure. When the eye-lids grow to the cornea it scarcely ever admits of a cure.

ANCHYLOMERIS, in medicine, a concretion of the soft parts.

ANCHYLOSIS, in medicine; from *αγκυλοω*, curvo; a stiffness or immobility of the joints. The mobility of a joint may be more or less interrupted by different diseases of the bones, particularly a tumefaction of their extremities, caries, fracture near to or within the joint, dislocation, twisting, and crushing of the bone; as well as by fleshy excrescences, aneurisms, hydropical accumulations, &c. The muscles also may give rise to the stiffness of a joint, when the flexors contract so strongly that the extensor muscles lose their force, in which case a contraction, as it is termed, is produced. To effect the cure of this, as of every other disease, we must first discover and remove the original cause, which having been done, emollients, poultices, blood-letting, and the vapour-bath, may be used with success, taking great care to move the joint gently and by degrees, lest any inflammation should arise.

ANCHURUS, the son of Midas, king of Phrygia, who, to propitiate the gods leaped into a

gulf, which an earthquake had opened, and which it was said would never close until his father had thrown in the most precious of his possessions. Midas erected there an altar of stone to Jupiter, which was the first object he turned into gold when he had received the power of so doing from the gods; and Plutarch speaks of this lump of gold being in existence in his time.

ANCI, in Greek, γαλιαγκωνες, weasel-elbowed; from γαλη, a weasel, and αγκων, an elbow; an epithet used by Hippocrates, for those who, by the head of the os humeri slipping into the ala, have an arm shorter than it ought to be, and seemingly like the elbow of a weasel; whence they are called by some mustelani, which fully expresses the Greek words.

AN'CIENT, *n.* & *adj.* } Immediately from
AN'CIENCY, } the French *ancien*,
AN'CIENTLY, } which is generally de-
AN'CIENTNESS, } rived from the Latin
AN'CIENTRY, } *antiquus*; from *ante*,
AN'CIENTY. } before.—Old; but of more force, and referring to remoter time. Ancient is opposed to modern, as old to new; the distance of time to which it relates is however not strictly defined.

Of noble actes *ancyently* enrolde,
Of famous princis and lordes astate,
By thy report ar wonte to be extold,
Regestringe trewly every formare date.
Percy's Reliques, vol. i. p. 97.

For sage wysdom's sake and for the vse of thynges, and also for restrainyng the wantonnes of youth, authoritie should be committed vnto the *ancientes*.
Udall. 1. *Paul to Timothy*, ch. v.

Of all nations under heaven, the Spaniard is the most mingled and most uncertain. Wherefore most foolishly do the Irish think to ennoble themselves by wresting their *ancientry* from the Spaniard, who is unable to derive himself from any in certain.
Spenser on Ireland.

Trebisond *anciently* pertained unto this crown; now unjustly possessed, and as unjustly abused, by those who have neither title to hold it, nor virtue to rule it.
Sidney.

The colewort is not an enemy, though that were *anciently* received, to the vine only, but to any other plant, because it draweth strongly the fattest juice of the earth. *Bacon.*

As for nobility in particular persons, it is a reverend thing to see an *ancient* castle or building not in decay; or to see a fair timber-tree sound and perfect.
Bacon's Essay on Nobility.

The Fescenine and Saturnian were the same; they were called Saturnian from their *ancientness*, when Saturn reigned in Italy. *Dryden.*

And though the *ancients* thus their rules invade,
As kings dispense with laws themselves have made;
Moderns, beware! or if you must offend
Against the precept, ne'er transgress its end. *Pope.*

AN'CIENT. A corruption of Ensign. See ENSIGN. Not in present use.

In the meane season, they which were besieged [in Calais] made knowne their state to the French king by signes and tokens; for at his first coming, they within the towne set up his *ancient* on the chiefest tower of the castle, and also they set out banners of the dukes and earles of France.
Stowe's Chro. Howe's Ed. 1614.

This is Othello's *ancient*, as I take it,—
The same indeed, a very valiant fellow. *Shakesp.*

ANCIENT, a term formerly used for the grand ensign or standard of an army.

ANCIENT DEMESNE. The number of names, &c. of all manors, after a survey made of them, were entered in a book called Doomsday-book, yet remaining in the exchequer; and such lands as by that book appear to have belonged to the crown at that time, and are contained under the title, terra regis, are called ancient demesne. The tenants in ancient demesne are of two sorts; the one hold their lands frankly by charter; the other by copy of court-roll, or by the verge, at the will of the lord, according to the custom of the manor. The advantages of this tenure are, 1. That tenants holding by charter cannot be rightly impleaded out of their manor; and when they are, they may abate the writ by pleading the tenure. 2. They are free from toll for all things relating to their livelihood and husbandry; nor can they be impannelled on any inquest. These tenants held originally by ploughing the king's land, plashing his hedges, &c. for the maintenance of his household; and it was on this account that such liberties were given them, for which they may have writs of monstraverunt to such as take the duties of toll, &c. No lands are to be accounted ancient demesne, but such as are held in soccage. The book of doomsday decides whether land be ancient demesne or not.

ANCIENT MUSIC; by this expression is more particularly understood such musical compositions as were composed from the time of Palestrina to that of Handel and J. S. Bach; i. e. from the year 1529 to 1684.

ANCIENTS, in inns of court, import a distinction of a certain degree. Thus in Gray's Inn there are benchers, ancients, barristers, and students under the bar; the ancients are the elder barristers. In the inns of Chancery there are only ancients and students; and among the ancients one is the yearly principal or treasurer. In the Middle Temple ancients are such as have past their reading.

ANCILLA, in entomology, a species of phalæna of the bombyx tribe. This is the Fabrician obscura, and the noctua ancilla of Schmettere It is a native of Germany according to Gmelin and of Italy according to Fabricius. The phalæna ancilla of Cramer is an Indian insect th noctua dioscorea of Fabricius.

ANCILLARY. Lat. *ancilla*, (perhaps from the obsolete word *ancillare*, to administer,) a female servant; a waiting-woman. Affording assistance in an humble capacity; rendering subordinate aid; subservient to.

ANCILLON (David), a minister of the reformed church, born at Metz in 1617. He was entered in his tenth year in the Jesuits' college where he gave such proofs of his genius, that the heads of the society tried every means to draw him over to their party; but he continued firm against their attacks. In 1623 he went to Geneva, and studied divinity under Spanheim Diodati, and Tronchin. In 1641 the synod of Charenton gave him the church of Meaux where he acquired great reputation. He returned to Metz in 1653, and remained there till the revocation of the edict of Nantes in 1685. He then retired to Francfort, and abou

the end of 1685 became minister at Hanau. A great jealousy in the other ministers tending to make his situation uneasy, he afterwards removed to Berlin. Here he died in 1692, aged seventy-five. His library was one of the noblest collections in the hands of any private person in the kingdom. His principal works are, his Apology for the Lives of Luther, Zuinglius, and Beza; Life of William Farel; and an Account of the Dispute concerning Traditions.

Ancillon (Charles), eldest son of the preceding was inspector of the French courts of justice at Berlin, and historiographer to the king of Prussia. His public works are, Critical Remarks on the public Edifices of Berlin; the Life of Soliman the Magnificent, a Tract on the Revocation of the Edict of Nantes; Memoirs of the Lives and Writings of the most celebrated modern Characters in the Republic of Letters. He died at Berlin in 1715.

ANCISTRUM, in botany; from *αγκιστρον*, a hook; a genus of themonogynia order, and diandria class of plants of the natural order of rosaceæ. Its generic characters are, cal. perianth. one-leafed: cor. superior: stam. filaments capillary: anth. roundish: pist. germ oblong: sty. filiform: stig. pencil-shaped: per. none: seed single. The species are three: 1. A. decumbens; 2. A. lucidum, shining ancistrum; 3. A. latebrosum, hairy ancistrum.

ANCLABRIS, among the ancient Romans, a table in temples, whereon the priests eat their portion of the sacrifices and oblations.

ANCLAM, a strong town in the circle of the same name, in Western Pomerania, Upper Saxony, and seated on the Pene, thirty-six miles S.S.E. of Stralsund. Its ancient name was Tanglim, whence some have supposed it to have been the seat of that body of Saxons, called by Tacitus, Angli, some of whom emigrated to South Britain. In latter times it made a figure among the Hanse towns; being advantageously situated amidst excellent pasture lands and fertile corn-fields; and the river Pene affording good opportunities of fishing, and exporting their produce. The preacher for the time being in the church of St. Nicolas is superintendent of the Anclam synod, which consists of twenty clergymen. Anclam has several yearly markets; its manufactures are woollen cloth, and other stuffs, leather, and snuff-boxes. It was first ceded to Prussia by Sweden in 1720, and suffered severely during the seven years war, when its works were entirely demolished.

ANCLIFF, a small town in Lancashire, two miles from Wigan. It has a hot spring, called the Burning Well, which is cold and has no smell; yet a sulphureous vapour issues from it upon emptying the well, and the water bubbles up as if boiling: upon putting a lighted candle thereto it immediately catches the flame like spirits; it burns several hours, and sometimes a whole day, in calm weather, with a heat strong enough to boil a pot, though the water itself remains cold, and will not burn when taken out of the well.

ANCOBER, a river and territory on the gold coast of Guinea, west of Axim.

ANCLOTE, a small island near the coast of Florida, between Charles Bay and the river St. Pedro. Long. 83° 41′ W. lat. 29° 4′ N.

Anclote Point, a promontory on the peninsula of California. Long. 115° 11′ W. and lat. 29° 17′ N.

ANCOCUS Creek, a river of North America, in New Jersey, falling into the Delaware, six miles south-west of Burlington. It is navigable sixteen miles from its mouth, and considerable quantities of timber are exported from it.

ANCON, in ancient geography, or Ancona, a celebrated town of the Picene, now well known under the latter name. It was a Sicilian colony, and derived its name from its situation, which resembles the bend of the elbow. A medal of this town represents, as in the annexed figure, an arm embowed, or bent, so as to make an elbow. The port built by the emperor Trajan was once the finest in Italy; and the temple of Venus at this place was greatly celebrated. For its modern history see Ancona.

Ancon, in anatomy, the gibbous eminence or flexure of the arm, whereon we rest in leaning, commonly called olecranum.

Ancon, in antiquity, was used by the Carthaginians, to denote a dark prison or dungeon. Suidas mentions one in which Gelimer used to confine all who displeased him, and from which Belisarius delivered many persons.

Ancon, in architecture, the corner or quoin of walls, cross beams, or rafters. In the ancient architecture it denoted the two branches of a square which meet in a right angle, as well as the brackets or shouldering pieces, called consoles and corbells by the moderns.

ANCONA, a province in the papal territories in Italy. It lies between the Adriatic on the east, and the Appenines on the west; Abruzzo on the north, and the duchy of Spoletto and that of Urbino, on the south. The air is indifferent; but the the soil is fruitful, particularly in hemp and flax, and there is great plenty of wax and honey. It contains several large towns, which are all episcopal or archiepiscopal sees.

Ancona, a sea-port of Italy, the capital of the district of that name, and the see of a bishop; situated fifteen miles north of Loretto, and 115 east of Rome. Clement XII. made it a free port, and built a mole for the security of the harbour upon the ruins of the ancient mole of Trajan. This mole is about 2000 feet in length, 160 in breadth, and sixty in depth below the surface of the sea. The harbour is the best in all the pope's dominions, and abounds with a peculiar species of shell-fish, called bellari; and at Rome, becconi di cardinale, or dainties fit for a cardinal. The town is situated on two hills; one of which is at the point of Cape St. Syraco, whence there is a delightful prospect. On the other stands the citadel, commanding the town and harbour. The streets are said to be narrow and contain few buildings of any importance or architectural beauty. The cathedral is a low structure, but faced with fine marble. The exchange is a handsome square portico, in which is an equestrian statue of Trajan. The trium-

phal arch of Trajan of veined marble, which was built upon the mole, remains almost entire. The Jews are numerous here, and reside in a particular quarter of the city. This town partook considerably of the late agitations of Europe. In February, 1797, it was taken by General Victor, after the battle of Imola, but restored to the pope by a treaty of peace on the nineteenth of the same month. Little more than two years after this it was blockaded by the Russians and Turks, and in thirteen days surrendered. In 1801 it was again assigned to the French, who returned it the following year to the pope. In Ancona there is a sugar refinery, a manufacture of white paint and lead introduced from England, and a considerable soap-work. Its principal exports are, wool, grain, silk, skins, ship-biscuits, sail-cloth, sulphur, alum, soap, and fruit. It is no uncommon thing to find marquesses and counts engaged in commerce. The tide does not rise at Ancona above a foot, and near the Mediterranean is scarcely visible. Lon. 13° 35 E., lat. 43° 36′ N.

ANCONÆUS Musculus, in anatomy, the sixth muscle of the elbow, so called as being situated behind the solid of the ancon or elbow.

ANCONY, in the iron-mills, a bloom wrought into the figure of a flat iron bar, about three feet long, with two square rough knobs, one at each end. About three quarters of cwt. is melted off from a sow of cast iron; then hammered at the forge into a mass of two feet long, and of a square shape, called a bloom; this is sent to the finery, where, after two or three heats, it is brought to the figure above mentioned, and called an ancony. The middle part is about three feet long, and of the shape and thickness the whole is to be; this is sent to the chasery, where the ends are wrought to the shape of the middle, and the whole made into a bar. See Bar.

ANCORALIA, in antiquity, the ropes to which the anchors of ships were fixed.

ANCOURT (Florent Carton, d'), a French actor and dramatic writer, born at Fontainbleau in 1661. He studied in the Jesuits' college at Paris, and after he had gone through a course of philosophy, applied himself to the civil law, of which he was admitted advocate at seventeen years of age; but marrying an actress, he embraced her profession; wrote numerous plays, many of which still keep possession of the French stage; and was much in favour at the court of Louis XIV. Ancourt at length quitted the theatre in 1718, and retired to his estate of Courcelles le Roy, where he applied himself wholly to devotion, and composed a translation of the psalms in verse and a sacred tragedy, which were never printed. He died in 1726, aged sixty-five. He wrote in all fifty-two plays, which, in the last edition, 1750, make nine volumes.

ANCOVE, a district of Madagascar, near the centre of the island, on the east side of the great range of mountains. The air is healthy though thin, and frequently cold. The inhabitants are called Hovas or Amboilambs. The barrenness of the soil renders it impossible for them to support themselves by agriculture. Hence the slave trade is carried on to a much greater extent here than in any other part of Madagascar. The principal town is very irregular, and called Tanane Arrivon, which signifies, thousands of villages united

ANCRE, a small river of France, in the department of Somme.

Ancre, a town of France, department of Somme, seated on and named after the river; fifteen miles from Amiens, and twelve west by north of Perone. Here are salt-petre works, and a post office, and small bleaching-fields.

ANCREE, or Anchored, in heraldry, a sort of cross so called, because the four extremities resemble the fluke of an anchor.

ANCRUM, a parish of Scotland, in the centre of the county of Roxburgh, extending with Langnewton which is united to it, between five and six miles in length, on the north side of the Teviot, and about four in breadth. It is three miles north of Jedburgh, and forty-five south-east of Edinburgh.

ANCTERES, in ancient medicine, seem to have been the same as our sutures. Some also speak of a strong kind of sticking plaster under this denomination

ANCUBITUS, among ancient physicians, a disease of the eyes, wherein there is an appearance of sand or little stones sprinked on them It is also called petrification

ANCUS (Martius), the fourth king of Rome succeeded Tullius Hostilius A. C. 639. He defeated the Latins, subdued the Fidenates and conquered the Sabines, Volscii, and Veientines: he rebuilt the temple of Jupiter Feretrius in a very magnificent manner; and spent the latter years of his reign in improving the city and enriching its inhabitants: he enlarged Rome by joining to it mount Janicula, and founded the harbour of Ostia. He died about A. C. 613 after a prosperous reign of twenty-four years.

ANCY-LE-FRANC, a small town of France the head of a canton in Champagne, department of the Yonne, arrondissement of Tonnerre thirty miles east of Anderre. It has a beautiful castle and gardens, and about 1200 inhabitants

ANCYLE, in antiquity, a small brazen shield said to have fallen from heaven in the reign of Numa Pompilius, a voice being heard at the same time declaring that Rome should be mistress of the world while she preserved the shield. Though there was but one ancyle that fell from heaven, yet there were twelve preserved; Numa, by the advice, as it is said, of the goddess Egeria, having ordered eleven others perfectly like the first, to be made by Veturius Mamurius, that if they should attempt to steal as Ulysses did the Palladium, they might not be able to distinguish the true ancyle from the false ones. These ancylia were preserved in the temple of Mars, and committed to the care of twelve priests instituted for that purpose. They were carried every year, in the month of March in procession all round Rome; and on the thirtieth of that month were again deposited in their place.

Ancyle, in medicine, a fixation of the joint from a settlement of the humours. See Anchylosis.

ANCYLOGLOSSUM; from αγκυλος, crooked, and γλωσσα, the tongue; tongue-tied, a contraction of the ligaments of the tongue. Some have this imperfection from their birth, others from disease. In the first case the membrane which supports the tongue is too short or too hard; in the latter, an ulcer under the tongue, healing and forming a cicatrix, is sometimes the cause. The proper method of treatment is to snip this membrane with scissars in two or three places, taking care not to extend the points of the scissars as far as the frænulum.

ANCYLOMELE; from αγκυλος, crooked, and μηλη, a probe; a surgeon's crooked probe, or probe with a hook.

ANCYLOSIS. See ANCHYLOSIS.

ANCYLUS, in conchology, a name given by Geoffroy to the patella lacustris of Linnæus.

ANCYRA, in ancient geography, the capital of Galatia, near the river Halys, said to have been built by Midas, king of Phrygia, and named from an anchor found there. This town struck medals of Nero, Nerva, Antinous, Antoninus Pius, L. Verus, Commodus, Sept. Severus, Caracalla, Geta, Trajan, Valerianus sen. Gallienus Salonina. It was greatly improved by Augustus, deemed the second founder of it, as appears from the Marmor Ancyranum. It is now called Anguri, or Angouri.

ANCYROIDES, αγκυροειδης, or coracoides, in anatomy, the process of the shoulder bones in form of an anchor.

ANCYSTRUM, in botany. See ANCISTRUM.

AND. According to Tooke's hypothesis the imperative an-ad of the verb *anan-ad.* to provide or furnish in a mass. *An* is often used for *and* by the chroniclers.

He nome wyþ hym of Engelond ȝod knyȝt monyon,
An myd gret poer and muche folc puderward vende anon.
So þat he sone come bysyde hys fon echon,
An bylenede hym þer al nyȝt, and al hys ost al so,
An poȝte anon amorwe strong batayle do,
R. Gloucester, p. 319.

Sure his honesty
Got him small gains, but shameless flattery
And filthy beverage, *and* unseemly thrift,
And borrow base, *and* some good lady's gift. *Spenser.*
What shall I do to be for ever known,
And make the age to come my own? *Cowley.*
The Danes' unconquer'd offspring march behind;
And Morini, the last of human kind. *Dryden.*
It shall ever be my study to make discoveries of this nature in human life, *and* to settle the proper distinctions between the virtues *and* perfections of mankind, *and* those false colours *and* resemblances of them that shine alike in the eyes of the vulgar.
Addison.

ANDA, in botany, a tree of Brazil, the wood of which is spongy and light; the leaf long, fibrous, and pointed; the flower yellow and large, and the fruit a gray nut, which encloses two kernels of the taste of chestnuts in a double rind. The fruit is said to be purgative and slightly emetic: two or three of the kernels supply a dose. Oil is pressed from these kernels, with which the natives anoint their limbs. The rinds of the fruit thrown into ponds kill the fish.

ANDABATÆ; from αναβαται, mounted; in antiquity, a sort of gladiators, who mounted on horseback or in chariots, fought hood-winked, having a helmet that covered their eyes, whence the proverb 'andabatarum more,' denoting rash inconsiderate measures.

ANDACOLLO, a town of the province of Coquimbo, in Chili; and the seat of the gold mines of the district.

ANDAHUAILAS, a province of Peru, bounded on the north-east by the province of Aimaraez and Abancay and the mountains of the Andes; on the south-east by Parinacocha, south by Lucanas, and west by Vilcas Huaman. Its length from north-west to south-east is seventy-two miles, and forty-five miles from east to west. Being mountainous, and consequently cold, it produces all the fruits natural to a temperate climate. It produces annually 750000 pounds of sugar. Population 12,000.

ANDALUSIA, the most western province of Spain, bounded on the north by Estremadura, La Mancha, and the Sierra Morena mountains; on the east by Granada and Murcia; on the south by Granada, the straits of Gibraltar, and the Atlantic Ocean; and on the west by Alentejo and Algarva in Portugal, from which it is separated by the river Guadiana. Its greatest length is 250 miles, and its breadth 160 miles. The chief cities and towns are Seville the capital, Baeza, Gibraltar, Cordova, Cadiz, Medina Sidonia, Jaen, Port St. Mary, &c. It is the best, most fruitful, and the richest part of all Spain; and abounds in all kinds of fruits, wines, grain, silk, sugar, oil, cinnabar, and other metals. The Andalusian bulls are in great request, and the wool is a considerable article of commerce. It has a good air, a serene sky, a fertile soil, and a great extent on the sea-coast fit for commerce.

ANDALUSIA, NEW. See GUIANA, PARIA, and CUMANA.

ANDALUSICUS, in ornithology, a species of the tetrao inhabiting Andalusia, the Andalusian quail of Latham.

ANDALUSITE is a massive mineral, of a flesh colour, but sometimes rose-red; occasionally crystallized in four-sided rectangular prisms, approaching to rhomboids. The structure of the prisms is lamellar, with joints parallel to their sides. It is translucent, and scratches quartz; is easily broken. Its specific gravity is 3.165; infusible by the blowpipe; in which respect it differs from felspar, though called felspath apyre by Haüy. It is composed of fifty-two alumina, thirty-two silica, eight potash, two oxide of iron, and six loss. It belongs to primitive countries, and was first found in Andalusia in Spain. It is now seen in mica slate in Aberdeenshire, in the Isle of Unst, at Dartmoor, at Killiney near Dublin, and at Douce mountain in the county of Wicklow

ANDAMAN, the GREAT, and the LITTLE, are the names of two islands in the Bay of Bengal, so far connected with our East India empire as to furnish occasional anchorage, and one very good harbour for ships of war, during the prevalence of the north-east monsoon. They are surrounded by numerous islands, of the general name of the Andamans; these are the two principal ones. The Great Andaman, lying in north latitude 10° 32, and 92° 3′ east longitude,

is 145 miles in length, by twenty-five miles in average breadth; two narrow straits divide it into what might properly be called three islands, and the name of Chatham Island is given to the northern portion, in which Port Cornwallis is situated. The Little Andaman lies southerly of the group, about thirty miles from the Great Andaman, and is twenty-eight miles long by seventeen broad. It contains no harbour for shipping, but good anchorage is found near the shore. The tides are regular here, rising about eight feet in the springs, and the flood setting in from the west.

The population, scattered over the whole group, amounts to about 2300 or 2500 souls. They are described as amongst the ugliest and most barbarous of the human race; are never clothed but in their own peculiar way of regularly in a morning besmearing themselves with mud from head to foot, which, baking in the sun, is found to protect them from the insects that abound here. They live in huts composed of four sticks fastened transversely at top, and covered by branches of trees. Their woolly hair they soak in a mixture of red ochre and water. Their only bed is formed of leaves heaped together. Of religious principles, as far as their habits are known, they have none. The traveller who accidentally sees them crawl into their huts, or receives their curious salutation of lifting up one leg and striking the under part of the thigh, hardly knows whether he is beholding a creature entitled to the name of man.

A variety of useful woods for masts and shipbuilding are found here, as well as for furniture and ordinary building. The ichneumon, and a degenerated breed of swine are said to be the only quadrupeds; the birds also are few; and the fish only abundant in the north-east monsoon. At this period the shell-fish, particularly oysters, are very fine. The inhabitants generally appear half starved, though they are said to shoot and spear fish with great skill.

In 1791 a British settlement was attempted on the northern extremity of the Great Andaman, which was removed in 1793 to Port Cornwallis on the east of the island, and about fifteen miles from its northern point. The design was to establish means for the accommodation of shipping during the north-east monsoon, and to make it a place of banishment for the criminals of Bengal. But the insalubrity of the air, and disputes with the natives, induced the abandonment of the place shortly after this removal.

ANDAMENTO, in music, denotes one of the three species of subject suited to a fuge. It embraces all the notes of the key, or even more, and generally contains two or more members, or incidental phrases.

ANDANTE, in music, signifies a movement moderately slow, between largo and allegro. Andante largo signifies that though the music must be performed slow, yet the time must be observed very exactly and the sound of each note kept distinct.

ANDAYE, a town of France, in the department of the lower Pyrenees, arrondissement of Bayonne, famous for its brandy. It is seated on the mouth of the Bidassoa, opposite Fontarabia in Spain, ten miles from Bayonne.

ANDECAVI, ANDEGAVI, or ANDES, in ancient geography, a people of Gallia Celtica, having the Turones to the east, the Namnetes to the west, the Pictones to the south, and the Aulerci Cœnomani to the north. The province is now called Anjou.

ANDEGAVUM, the capital of the Andegavi, is now called Angers.

ANDELES. See ANDELY.

ANDELFINGEN, a market town and district in the Swiss canton of Zurich, circle of Wintertnur, between the towns of Schaffhaussen and Winterthur. It lies on the river Thur, which is here crossed by a covered bridge. The adjoining country, particularly the Val de Flaach, is rich in corn, wine, and fruits.

ANDELLE, a river of France, in the department of the Eure. It rises in the neighbourhood of Forges, and falls into the Seine nine miles above Rouen. Large rafts of timber, cut in the woods of Peitre and Lyons, are carried down this river to Paris.

ANDELY, or ANDELES, a town and arrondissement of France, in the department of the Eure, divided into two parts by a paved causeway. Here is a fountain to which pilgrims formerly flocked from all parts on the feast-day of the saint to which it is dedicated. It is twenty-six miles south-east of Rouen, and forty north-west of Paris.

ANDENAS, a small island of Norway, in the government of Drontheim.

ANDEOL, ST. a town of France, in the department of the Lozere, five miles south of St. Viviers.

ANDERA, in ancient writers, a swath in mowing; as much ground as a man can stride over at once.

ANDERAB, the most southern city of the province of Balkh, possessed by the Usbeck Tartars. It is rich and populous, but of no great strength. The neighbouring mountains yield quarries of lapis lazuli, in which the Bukhars carry on a great trade with Persia and India. There is no other way of crossing the mountains but by the road through this city.

ANDERENÆ SAL, in natural history, a name given by many of the old writers to the natron of the ancients. See NATRON.

ANDERLECHT, a fortress of Brabant, two miles north of Brussels, and containing 1930 inhabitants.

ANDERNACH, a city of Cologne, in the circle of the Lower Rhine, fortified with a wall castle, and bulwarks. It has a trade in stone jugs and pitchers, many of which are sent to the mineral waters at Dunchstein. Near it is the place of junction of the various small timber floats, intended to form the great float of 100 feet in length and 90 in breadth, commonly destined for Dort in Holland. This immense raft is piloted in its course by 400 men, and when sold produces generally 100,000 florins, £10,000 sterling. There are three monasteries here, and several churches. It is six miles north-west of Coblentz, and twenty-five S. S. E. of Cologne.

ANDERO, St. See Santander.

ANDERSON (Alexander), a mathematician of the sixteenth century, who published, 1. A Supplement to Apollonius, entitled Supplementum Apollonii Redivivi, 4to. Paris, 1590; 2. Αἰτιολογία, pro Zetetico Apolloniani Problematis a se jam pridem edito in Supplemento Apollonii Redivivi, &c. 4to. Paris, 1615; 3. Francisci Vietæ de Equationum Recognitione et Emendatione Tractatus duo, 4to. Paris, 1615; 4. Vietæ Angulares Sectionis, &c. He was born at Aberdeen, and became professor of mathematics at Paris.

Anderson (Sir Edmund), a younger son of an ancient Scotch family settled in Lincolnshire. He studied at Lincoln College, Oxford; and in the Inner Temple. He was appointed queen Elizabeth's serjeant-at-law in the nineteenth year of her reign; and in 1582 lord chief justice of the common pleas. He was one of the commissioners to try Mary queen of Scots; and died in 1605. His works are, 1. Reports of many principal Cases argued and adjudged in the time of queen Elizabeth in the Common Bench, London, 1644, folio; 2. Resolutions and Judgments on the Cases and Matters agitated in all the Courts of Westminster in the latter end of the reign of queen Elizabeth, London, 1653, 4to.

Anderson (Adam), descended of Scottish parents, was many years a managing clerk in the South Sea House, a trustee for the settlements in Georgia, and in the court of the Scotch corporation. He published Historical and Chronological Deductions of Trade and Commerce, 2 vols. folio; and died at the advanced age of 75, in 1765.

Anderson (James), brother of the preceding, was minister of the kirk of Scotland to a congregation in Swallow-street; and left behind him a treatise on the Constitutions of Freemasonry, and Royal Genealogies, folio.

Anderson (John), was born at Hamburgh in 1674, of which city he rose to be syndic, and was employed as negotiator of its concerns in different courts of Europe. He published the Natural History of Iceland, Greenland, Davis's Straits, and other northern regions.

Anderson (George), a peasant, born in 1760 at Weston, Buckinghamshire, early displayed such extraordinary mathematical genius, that the Rev. Mr. King of Whitchurch placed him at a grammar school, and afforded him the means of prosecuting his studies at Wadham college, Oxford. On his declining afterwards to take priest's orders, his worthy patron procured him a place under the Board of Control, whence he rose to be accomptant-general. He published, A General View of the Affairs of the East India Company, since the conclusion of the War, in 1784, in 4to.; and translated from the Greek of Archimedes, Arenarius, or a Treatise on Numbering the Sand. Mr. A. died in 1796.

Anderson (James), an antiquarian of the Scottish bar, was born in 1662, and died in 1728. He wrote, 1. An Essay showing that the Crown of Scotland is Imperial and Independent, 8vo. Edinburgh, 1705; being an Answer to Mr. Atwood's book, entitled The Superiority and direct Dominion of the Imperial Crown and Kingdom of England over the Crown and Kingdom of Scotland; 2. Collections relating to Mary Queen of Scotland, 4 vols. 4to. Edinburgh, 1727; 3. Selectus Diplomatum et Numismatum Scotiæ Thesaurus, folio, 1739, to which Ruddiman supplied a preface.

Anderson (James), a Scottish miscellaneous writer of great eminence, was born about the year 1739 at Hermiston, a village six miles from Edinburgh. His family had long been respectable farmers; and our author may be said to have inhaled with his first breath that spirit of agricultural knowledge for which he became so distinguished. Deprived of both his parents while yet young, he was discouraged by his friends from prosecuting his studies beyond a common school education; and designed to be the plodding occupier of the paternal farm; but having, as he informs us, read Home's Essay on Agriculture, and finding that he could not understand the reasoning for want of chemical knowledge, he immediately resolved to attend Dr. Cullen's lectures on that science, and found in this learned author a sincere friend, who carefully directed his future studies. He did not, however, neglect the duties of his farm, of which he took the management upon himself about the age of fifteen, assisted by his four sisters. About this time Dr. Cullen delivered a course of lectures on agriculture, in a private manner to a few of his friends and favourite students, of which Anderson was the only person who took notes. He now introduced for the first time the small two-horse plough, at present in universal use over the greater part of Scotland. His friends, soon perceiving that his ardour in the pursuit of literary knowledge was not to be controlled, suggested the propriety of his following the medical profession; but to this he imbibed a decided aversion, and therefore determined to prosecute his original line of life. Having occupied Hermiston for a few years, he took, while yet a minor, a larger farm in the wilds of Aberdeenshire, consisting of about 1300 acres of land almost in a state of nature. In the midst of the difficulties with which he had to contend in bringing this tract into cultivation, he began his career as an author with his Essays on Planting, &c. first printed in the year 1771 in the Edinburgh Weekly Magazine, under the signature of Agricola. His Essays on Agriculture, Observations on National Industry, and several of his early writings, were composed during a residence of more than twenty years at Monkshill, the name of the above-mentioned farm. In 1768 our author married Miss Seton, of Mounie, a descendant of the ancient and noble house of Winton, who brought him thirteen children. By this marriage the estate of Mounie, in Aberdeenshire, came into his possession; and his merits as an author becoming now generally known, his acquaintance and correspondence began to be courted by men of letters, and his society sought by persons of the first respectability. In the year 1780 the honorary degrees of A. M. and LL. D. were conferred on him by the university of Aberdeen. In 1783 he removed to the neighbourhood of Edinburgh,

with a view to the better education of his increasing family, and about the same year printed and circulated proposals for establishing the Northern British Fisheries. The attention of government being excited to the subject, he was applied to by the treasury to undertake a survey of the western coast of Scotland, for the purpose of obtaining further information on this topic; to which, with great public spiritedness, he devoted himself without any recompense. In 1788 he was deprived of his wife. About this time he was employed in his researches on the subject of sheep, and the improvement of wool, in concert with Sir John Sinclair; his opinions upon which, delivered to the Highland Society, are before the public. We next find him engaged in preparing for the publication of the Bee, a weekly periodical work designed for the dissemination of useful knowledge among all ranks, and which met in the first instance with the greatest encouragement from the public. Nothing indeed but great mismanagement in conducting the commercial part of the work, for which, like many authors, he was ill adapted, could have caused it to fail in being a very profitable concern to him. His own writings form a conspicuous part of this book, under the name of Senex, Timothy Hairbrain, Alcibiades, and the greater part of the matter without signature. He numbered at this time amongst his correspondents General Washington, Dr. Franklin, Mr. Johnes the elegant biographer of Froissart, &c. In the course of this publication Dr. Anderson became involved in a dispute with the public authorities, respecting some revolutionary doctrines supposed to be contained in it; and having settled most of his family, he removed to the vicinity of London about the year 1797. In April, 1799, appeared the first number of his Recreations, a miscellaneous monthly publication, having for its principal objects agriculture and natural history; it was continued to the extent of 6 vols. 8vo. During the publication of them he wrote and printed separately his Correspondence with General Washington, and a Calm Investigation of the Scarcity of Grain. The 37th number of his Recreations, which appeared in March, 1802, is his last publication. Dr. Anderson died on the 15th of October, 1809, aged sixty-nine. Other works of this writer are, 1. Thoughts on the Privilege and Power of Juries, 8vo.; 2. Remarks on the Poor Laws in Scotland, 4to.; 3. A Practical Treatise on Peat Moss, 8vo.; 4. An account of the different Breed of Sheep in the Russian Dominions, 8vo.; 5. Practical Treatise on Draining Bogs and Swampy Grounds, 8vo.; 6. On an Universal Character, 8vo. 7. Observations on Negro Slavery, 8vo. The writings of Dr. Anderson did much to excite that general attention to agriculture which became so prevalent throughout Great Britain before his death. He wrote several articles in the Encyclopædia Britannica, and also in a Monthly Review.

Anderson (Walter), a Scottish clergyman of Churnside, where he died in 1800; he wrote 1. A History of France at different periods, 4to. 5 vols; 2. The Philosophy of Ancient Greece investigated in its Origin and Progress to the æras of its greatest celebrity; &c.

Anderson, a county of the state of Tennessee, North America. Population in 1820, 4668. Clinton is the chief town, 150 miles east by north of Murfreesborough.

Anderson's Island, an island in the North Pacific Ocean, near the north-western coast of America, so named by Captain Cook. Lon. 197° 40′ E. lat. 63° 10′ N.

ANDES. A stupendous chain of mountains, the most celebrated in the New World, called by the Spaniards 'Cordillera de los Andes;' which, commencing at the mouth of the river Atrato on the isthmus of Darien, in the eighth degree of north latitude, stretches through the whole continent, from north to south, in a line parallel to the Pacific, as far as Cape Pilares in the Straits of Magellan, a distance of at least 4200 miles. M. Humboldt, and some other writers, extend the parent ridge northward into New Spain, and consider the rocky or stony mountains of North America as forming a continuation of it as far as the northern limits of the American coast on the border of the Frozen Ocean. In this view the Andes form a most important chain, penetrating in its course from north to south almost all the climates of the earth, and presenting in some of its single heights perpendicularly an epitome of all the seasons. Under the equator they attain their greatest altitude, the Chimborazo standing to the elevation of 21,000 feet from the level of the ocean. Near the top respiration is difficult, and the cold more excessive than in any known region of the arctic seas; toward the base the temperature is warm and luxuriant; and the lower savannas often glow with the utmost heat of the tropics. The plains of the Andes are distinguished by their remarkable elevation, which exceeds some of the loftiest mountains of the old world. Volcanic peaks are numerous in every stage of activity, pouring out their inexhaustible fires in regions of perpetual frost. There are also horrid crevices in the mountains, reaching to the depth often of several thousand feet, from which streams issue in all directions to the surrounding seas. Earthquakes also are frequent, some of which have engulfed whole mountains and cities. So that these regions unite almost every thing delightful with every thing terrific in nature.

The principal chain of the Andes pursues a mean distance of 150 miles from the western shore, traversing New Granada, Quito, Peru, Chili and Patagonia. It is rich in metals, and abounds in volcanoes. The mountains of this prodigious range differ exceedingly in shape. In some parts they are crowded together in one entire mass; in others they exhibit two or three distinct ridges connected by longitudinal valleys. In Chili the Andes are 120 miles broad, and consist of a great number of mountains chained together all of a prodigious height. The first separation of the main chain southward is in New Granada, which continues in distinct ridges from north lat. 5° 15′ to 2° 30′, forming three lines nearly parallel to each other; the western one being a continuation of the mountains in the provinces

of Darien, in some places reaching the height of 4500 feet, and dividing the province of Choco on the west from the river Cauca eastward. The middle ridge is the loftiest of the three, and runs between the latter stream and the waters of the great river Magdalena. Its head is elevated into the regions of perpetual frost, and when illumined by the rising or setting of the sun is most magnificent. The three most elevated points are Guanacas, Baragan, and Quindiu mountains. The eastern ridge divides the Magdalena from the plains of Meta, but possesses no very lofty mountains. In the province of Popayan these ridges re-unite, and form a line across the equator; but in the province of Quito they separate at almost half their altitude into their two most remarkable and most elevated chains, comprising the Chimborazo, Cayambe Ureu, the Pichincha, Catopaxi, &c. At Cuença, in three degrees south latitude, they again terminate in the parent range, from which point to their southern extremity the Andes are little known; but, according to D'Anville, frequently consists of two or three pointed ridges from 100 to 150 miles in breadth, with immense plains between them; the average height of which from the level of the sea, is, according to Ulloa, from 8000 to 10,000 feet. In Peru the Andes assume with the coast a south-east direction, and divide into several subordinate branches, forming immense plains, called table-land. In the Uplands many remarkable streams have their sources, which eventually uniting form the majestic river Maragnon. The lake Titicaca, or Chucuito, is embosomed between two parallel ridges of the Andes, receiving from ten to twelve large rivers into its bosom. It is 240 miles in circumference, and navigable for the largest vessels. The island of Titicaca, pointing up from the waters, is supposed to have been once the residence of Manco Capac, and formerly adorned by the incas of Peru with the celebrated Temple of the Sun. The great river La Plata, we remark, originates in these regions.

In Chili the Andes form three parallel ranges, of which the centre is by far the loftiest, containing several single mountains of more than 20,000 feet in altitude. Amongst which may be enumerated the Manflos, in south latitude 28° 45′; the Tupungato in 33° 24′; the Descabesado in 35°; the Blanquillo in 35° 4′; the Longavi in 35° 20′; the Chilian in 36°; and the Corcobado in 43°. The eastern and western ridges are from twenty to thirty miles distant from the principal range. Fourteen volcanoes have been discovered in this part of the Andes; from one of which an eruption occurred in December, 1760, which rent one of the mountains asunder, and formed a very considerable lake. Throughout the whole province this Cordillera maintains an uniform elevation, and with its plains a breadth of about 120 miles. From the twenty-fourth to the thirty-second degree of south latitude the Andes are wholly desert, when they begin to be inhabited by various barbarous tribes in alliance with the Araucanians. The Andes of Patagonia, or Terra Magellanica, are in the possession of savage nations.

The stupendous and lofty range of the parent Andes are described by Humboldt as sending out, at nearly right angles, three dependent branches, called by the Spaniards Cordilleras.

The first of these inferior divisions, called sometimes the Cordillera of New Granada, is on the coast of Venezuela. Though this chain is higher in point of general elevation than the others, it is inferior in breadth, and irregularly bends from the river Atrato to the east, until it reaches the stream of Magdalena, which flows through the province of St. Martha, forming in its course the Sierra of Abibe and of Cauca, and the lofty plains of Tolu. On its approach towards the Gulf of Mexico, it becomes contracted progressively until it reaches the vicinity of Cape Vela. This secondary chain, which may be said to terminate off the Galley Point in the island of Trinidad, attains its greatest known elevation where it rears its snowy summit, or Sierra Nevada of St. Martha and of Merida, the former being nearly 16,490, and the latter above 15,201 feet in altitude. These mountains, so near the equator, covered with eternal snow, yet discharging boiling sulphurous water from their sides, are higher than the celebrated Peak of Teneriffe, and have been compared to Mont Blanc. In their descent, leaving the Panamo, or lofty desert of Rosa and of Mucachi, they form on the west side of the lake Maracaibo long narrow vales covered with forests and stretching from south to north. At Cape Vela the mountain-chain divides into two parallel ridges, which form three valleys in the direction of east and west, having all the appearance of having been the beds of ancient lakes. Of these ridges the northern is the prolongation of the Sierra Nevada of St. Martha, and the southern a continuation of the snowy mountains of Merida, both of which are united again by two dams placed by the hand of nature as dikes for the confining of the primeval collection of water. These valleys, thus enclosed, are of extreme altitude, viz. that of Caraccas to the east is the highest, and was calculated by Humboldt at 2660 feet above the level of the sea. The Caraccas lake appears to have forced for itself a passage through the Quebrada or cleft of Tipé. That of Aragua appears to have been gradually dissipated by evaporation, leaving some vestige of its former magnificence in a few pools charged with muriate of lime, and the low islets of Aparecidas. The medium height of the Cordillera of the coast is about 4000 or 5000 feet. The loftiest summit next to the Sierra Nevada of Merida is the Silla (or Saddle) of the Caraccas, which Humboldt calculated, from barometrical admeasurement, at the elevation of 8420 feet. Farther to the east the mountain-chain, especially its primitive rocks, become suddenly depressed, the beds of gneiss and mica slate meeting with masses of secondary calcareous substances which envelope them, and rise to a considerable altitude. A detached range of mountains, in which no primitive rock can be found, is formed by an incumbent mass of sand-stone extending from Capelluari.

The second branch, which stretches from the Andes across the American continent, is a chain of primitive mountains, called by Humboldt, who

surveyed them for upwards of 600 miles, viz. from the Black River to the borders of the Grand Para, the 'Cordillera of the Cataracts of Orinoco.' It leaves the parent range between the third and sixth degrees of south latitude, and runs eastward from the Panamo, a high desert of Tuquillo and St. Martin, and the sources of the Guaviari, rearing the lofty summits of Umama and Canavami, and pouring forth the mighty rivers Ymerida, Meta, and Zama, which form the tremendous rapids of Aturé and Mayparé, commonly called the Roudals, the only openings existing between the interior of the continent and the plain of the Amazons. The chain of mountains again acquires greater elevation and breadth beyond the cataracts, and occupies the track enclosed by the rivers Caura, Padamo, and Cavony, and stretches southward to the boundless forests where the Portuguese gather that powerful drug the sarsaparilla. The remaining unexplored wilds and regions are rendered inaccessible by the Guaicas, a dwarfish but very fair race, and the Guajaribos, a most desperate tribe of cannibals, so that the sources of the Orinoco have never yet been seen either by European or by civilized Indian. Don Antonio Santos, disguised like a savage, his body naked, his skin stained of a copper colour, and speaking fluently the several Indian dialects, penetrated from the mouth of the Rio Carones to the lake of Parimé and the Amazons, and by this astonishing journey made us acquainted with the continuation of the chain. The range of mountains sinks lower, and contracts its breadth to 200 miles, where it takes the name of Serrania de Quimeropaca and Pacaraimo. After a short course to the east bends southward along the banks of the Mao to the Sierra Ucucuamo, or El Dorado (Golden Mountain), of the first visitors of South America, a hill which is entirely composed of shining yellow mica. Stretching across the country from this point eastward, the chain now meets the mountains of Dutch and French Guiana, supplying in its course the sources of the Essequibo, Marony, Surinam, and Berbice rivers. The highest known point of this chain is the active volcano of the Sierra Duida, in lat. 3° 13′, about 8,465 feet in altitude, which is surrounded by a rich savanna, thickly set with the tropical palm and anana, and regularly discharges at the close of the rainy season enormous volumes of flame. This chain, as far as it was seen by Humboldt, contained no alluvial formations, petrifaction, or organic remains, but was composed wholly of granite, gneiss, mica slate, and hornblende. The whole of this chain is remarkable for its abrupt precipices toward the south. Of the third chain mentioned by Humboldt, no part was surveyed by his party, but only became known to them by the report of those who had passed the immense dead flat, or Pampas, which separates it from the foregoing ridges. It is called the Cordillera of the Chiquitos, and is situated from the 15° to the 20° of south latitude, between the waters of the Maragnon and the Plata. Stretching from the main stem, in a semicircular form, it passes through the Chaco, Chiquitos and Moxos, uniting the bald summits of Peru and Chili with the mountains of Brazil and Paraguay.

These subordinate chains, branching off from the original, divide that part of the continent over which they stretch into immense plains, called the valley of Orinoco, that of Maragon, and the Pampas of Buenos Ayres, enclosed on the western side by the original stems, but open on the east and towards the Atlantic Ocean. Orinoco is covered with a coarse reedy herbage, and scattered with palms. Maragnon is covered with dense and impenetrable forests. The subsoil of these immense plains resembles the compost of the neighbouring mountains. In Orinoco the primitive rock appears wrapt in sand-stone, with calcareous cement, or covered with calcareous concretions. These betray vestiges of recent organic remains, but exhibit none of those older impressions, as the belemmites and ammonites of Europe.

The most southern valley, or the Pampas of Buenos Ayres, is a dead flat of great extent, clothed like the vale of Orinoco with coarse herbage, and occupied by wild cattle. It contains beds of a secondary formation to an enormous depth, in which the most luxurious fruits are found in perfection.

The mineralogy of the Andes generally has been but little explored. A few particulars may be gathered from the traveller who preceded Humboldt; but for any clear and satisfactory statement we must refer to that traveller.

According to Helms, the precious metals of Peru and Lima are deposited in veins of quartz or alluvial layers of sand-stone and iron-sand, resting in the argillaceous schistus, of which the great chain of the Andes is, according to this author, principally composed. At Potosi the principal silver mine abounds in ferruginous quartz, bedded in a fine yellow argillaceous slate. In the neighbourhood of the lake of Titicaca, he describes the basis of argillaceous schistus as covered with alluvial deposits of marl, gypsum, and lime-stone; sand, porphyry, and even rock-salt. Near Guancavilica the mountains are composed almost entirely of sand-stone and lime-stone; northward of this portion of the Andes they are more calcareous, yet rich in metallic ore.

Molina, in his Saggio Sulla Storia Naturale del Chili, describes the enormous masses of the Chilian Andes as consisting of 'a quartzose rock, of a composition almost uniform, and in which marine bodies are never found, as they are in the secondary mountains. 'On the summit of Descabesado,' he says, 'a most elevated mountain in the midst of the principal chain of the Andes, and which in height does not appear to be inferior to the famous Chimborazo of Quito, a number of marine shells has been observed, either petrified or calcined, and probably deposited by water. The summit of this mountain, which is flat, bears marks of a volcanic eruption; it is now a square plain, each side being about six miles in length; and in the middle is a lake of extreme depth, which, so far as can be judged by appearances, was the crater of the volcano. All the ridges on the sides of the Andes, as well as those more maritime, or more inland, are

secondary formation. Their summits are commonly more rounded; and they are formed in horizontal beds of various substances and thickness. In all these beds marine bodies abound; and even impressions of plants or animals are often discovered. I have observed in the excavations which have been made, and in the courses of the rivers, that the lowest visible bed of all these mountains is a kind of cos, or whet-stone, of a reddish colour, and sandy grain; but sometimes a quartz of sand, or a pretty compact tufa of a dark brown colour. The other beds are clays of different colours, marls, marbles of several kinds, schistus, spars, gypsum, fossil coal; after which appear metallic veins, ochre, quartz, granite, porphyry, sand-stone, and other rocks more or less hard. The order of the beds is not always the same; and I have often observed considerable derangements—a superior bed in one mountain being inferior in another; and in these derangements the laws of gravity are by no means observed. Nevertheless, all the beds, in general, effect a kind of regularity in their direction, which is from south to north; and as they incline a little to the west according to the fall of the sea, they seem to have followed the current of the ocean, which, on account of the position of the country, is from south to north. Besides the mountains composed of different beds, there are some of uniform structure; or homogeneous beds of lime-stone, gypsum, talc, cos, or whet-stone; of granite, of simple and primitive rocks, of basalt, lava, and other volcanic substances; and some of shells, little or not at all decomposed, as mentioned by Ulloa in his voyage. But all these homogeneous mountains are barren, only producing some languishing shrubs, while the mountains disposed in beds, which are always covered with a crust of good soil, present a vigorous and agreeable vegetation. The exterior form of all the stratified mountains furnishes another palpable proof of the incumbence of the ocean; their bases, which are almost always extensive, enlarging gradually, form gentle vales, whose inflexions and inclinations impress, in a lively manner, the long abode and direction of the ocean. Their salient and retreating angles also correspond. On descending into these vales, it may be perceived, without difficulty, that the organization is the same with that of the stratified mountains, as the same materials and disposition appear throughout, with this difference, that almost all the substances are decayed, or even reduced to earth.'

Humboldt found the whole of his second subordinate branch of the Andes, as we have intimated, composed of primitive rock, principally granite, which seems to be the probable base of the entire chain. Comparing this branch with the Cordillera of the coast in the Journal de Physique, he thus gives us the order in which the primary rocks appear. 1. Massive granite, occasionally mixed with jad and plumbago; 2. foliated granite and mica slate, interspersed with garnets; 3. primitive slate with beds of native alum; 4. slate mixed with hornblende, green-stone, amygdaloid, and great quantities of porphyry-slate. The usual arrangement or inclination of the primitive rocks, is to the north-west. In what he calls the secondary rocks, which compose the Andes of the coast of Venezuela, the granite is succeeded by gneiss and beds of primitive limestone; the mica slate is covered with hornblende and limestone, and this again with beds of lydian-stone, gypsum, petrisolen and calcareous free-stone. The granite is often stratified in beds from two to three feet thick, and contains large crystals of felspar. Red garnets and sapphire are frequently mixed with mica slate in the primitive rocks, and in the gneiss of the secondary rocks a few green garnets are found. In the Cordillera of the cataracts of the Orinoco large masses of a glowing yellow talc also appear, a substance which gave such celebrity to the El Dorano, in the centre of the Andes, as a golden mountain. Chlorite slate sometimes occurs in this Cordillera, and the most beautiful hornblende occasionally penetrates the streets of St. Thome and Guiana.

The only formations not found by Humboldt were those of roe-stone, chalk, gray-wacke, topaz rock, and the compound of serpentine with granular limestone, so common in some parts of Asia Minor. The supreme ridge of the Andes is generally covered with basalt, porphyry, phonolite, and green-stone; which, from their being often broken into columns, have at a distance all the appearance of ruined castles. Near the bottom of this ridge are found two different kinds of limestone, viz. one with a silicious base occasionally enclosing coal and cinnabar, the other calcareous concreting secondary rocks. Both of these formations are celebrated for their vast thickness and altitude. In the vicinity of Santa, the beds of coal occur 8650 feet above the level of the sea, and at Huduco in Peru, even at the altitude of 14,700 feet: gypsum, sandstone, shell, limestone, and rock-salt, are found in great abundance on the plains of Bogota at the height of 9000 feet: and fossil shells, which in the old continent have not been discovered higher than the summits of the Pyrenees, at the altitude of 11,700 feet, have been found in the vicinity of Micuipampa, in Peru, as high as 12,800 feet and even at 14, 120 feet. At Huancavelica sand-stone also appears. At Pichincha, near Quito, basalt occurs at the height of 15,500 feet, whilst the highest point of Germany where that species of rock occurs, viz. the summit of the Silesian Schneekoppe, has been calculated at the altitude only of 4225 feet. Granite however, which crowns the loftiest European mountains, is not found in any of the mountains of the New World beyond the height of 11,500 feet, and in the provinces of Quito and Peru is scarcely, known at all. The enormous summits of Chimborazo, Cayambé, and Antisana, consist of porphyry, which in the flanks of the Andes forms a mass of from 10,000 to 12,000 feet in depth. Near Cuença the sand-stone has a thickness of 5000 feet, and immediately west of Caxamarca, the stupendous mass of pure quartz exhibits a perpendicular depth of 9600 feet. The porphyry of these mountains never contains quartz, and but seldom mica, but frequently intermixtures of hornblende. Petrifactions do not frequently appear upon the Andes, but marine bodies are

often found. Impressions of plants and animals are also frequently discovered. The exterior formation of all the stratified mountains, says Molina, affords also a strong proof of the former superincumbence of the ocean. The same is indicated by their bases. On the summit of Descabesado, considered by some travellers as equal to the Chimborazo of Quito, a number of marine shells have been observed, supposed to have been deposited by the waters of the deluge. The summit is flat, and exhibits a square plain, each side of which is six miles in length. In the midst is a lake of extreme depth; it bears all the marks of volcanic eruption, and in short is supposed to have been the abyss of the volcano.

The central Andes are said to be extremely rich in all the metals, with the exception of lead. One of the most curious is the pacos, a compost of native silver, the muriate of silver, the oxide of iron and clay. The mines of Mexico and Peru promise to be more productive than ever. The whole Andes chain is, however, subject to the most terrible earthquakes: from Cotopaxi to the South Sea are found no fewer than forty volcanoes in a state of perpetual activity; the lower ones ejecting lava; others discharging the muriate of ammonia, scorified basalt, and porphyry, enormous quantities of water, and moya or clay mixed with sulphur and carbonaceous matter: and near Quito the myriads of small dead fishes thrown up in the liquid mud ejected by the volcanoes, have excited the astonishment of travellers. In some parts the imprisoned air let out of these mountains, produces gusts of wind so furious as to sweep every thing before them to an amazing distance. In other instances, the elements contending in the interior are betrayed by a doleful mourning noise, or hollow dismal groans, which fill the mind of the auditor with an awful fear.

The traveller who ascends the mountains of Switzerland is delighted to witness in the space of a few hours the successive changes of climate, intimated by the numerous corresponding features of the vegetable kingdom. He ascends, perhaps, from warm vineyards, and passes through a succession of chestnuts, oaks, and beeches, till he reaches the pines and birches, or treads on pastures bordering upon the dreary and loftier regions of perpetual snow; less beautiful, but infinitely more grand and majestic is the scene within the tropics; permanent congelation commences 7500 feet higher at the equator than at forty-five degrees of latitude. Ananas and plantains grow with great luxurance near the shore: oranges and limes a little higher; peas and wheat crops succeed at length in the lofty vale of Quito. The traveller experiences a climate analogous to that of Bourdeaux or of Geneva, diversified with its proper features and productions. From this point commences that series of plants and vegetables which beautifies the central regions of Europe.

The magnitude of the Andes has much less effect upon the beholder than might be imagined. The impression is diminished by the vast altitude at which the country altogether is heaved above the level of the sea. Chimborazo, Cotopaxi, and Antisana, though at least 6000 feet higher than Mont Blanc in Savoy, appear from the plains of Riobomba and Quito scarcely more sublime. But the central Andes, notwithstanding all their sublimity, are destitute of one feature which in the higher latitudes contributes so highly to the beauty and magnificence of Alpine scenery. They have no glaciers, those icy belts dropping from the limits of congelation, and spreading in concrete sheets, or hanging in disjointed columns, as formed in more northern regions. This defect is commonly attributed to the uniform temperature near the equator, the sun shining there all the year with nearly equal force, whilst in the higher latitudes the length of time which during summer the sun remains above the horizon, and the augmented force with which he shines, produces a change in the heat of the atmosphere, and consequently in that of the ground. This succeeded by the colds of winter produces that alternate thawing and freezing to which the formation of these translucid phenomena is ascribed. It is attributed to the same cause that the Andes, though torn by flaming volcanoes, and convulsed by frequent earthquakes, are exempt from those avalanches and emboulements which in Switzerland and many of the mountainous regions of Europe often bury the traveller with snow, and batter down whole villages by the sudden discharge of a shower of rocks. Under the equator the variation of temperature is insufficient to disturb the solidity of the snow, whilst in the Alps and Pyrenees the snow, loosened by the heats of summer, precipitates itself into the plain, sweeping away every thing in its course.

The quebradas, or perpendicular rents or chasms found in every part of the parent Andes, are frightful in the extreme. The noted crevices of Chota and Cutaco are nearly a mile deep, the former measuring 4950, and the latter 4300 feet in a vertical descent. For crossing these tremendous gullies many expedients have been invented. But the common mode is by means of men called *cargueros* or carriers, fastened to whose backs the travellers sit in chairs. A species of hanging bridge being thrown over the chasm from mountain to mountain, composed chiefly of the fibres of the agavè, strengthened with reeds and cane; the Indian takes his load, and swinging it to and fro in the blast, hums his tune, and contemplates around the awful abyss below. Often too these porters climb along the face of precipices bearing loads of from twelve to eighteen stone for a very small remuneration, till their backs are chafed raw with the load.

The Icononzo, beautified by natural bridges, is a small cleft in the mountains, through which the river of the Summa Paz flows, descending from the highest upland desert. The rocks consist of sand-stone, but of two different species: one extremely compact, the other slaty in texture, and divided into thin horizontal strata. The rent is supposed to have been produced by means of an earthquake, which the more solid portion of the stony mass resisted, and still remains in its primitive position, connecting the upper division of the chasm. This natural arch is 300 feet above the surface of the torrent, the medium depth of which is twenty feet. It

is also fifty feet long, forty broad, and eight thick in the middle. Not more than sixty feet below this phenomenon is a second arch composed of three standing rocks wedged together, supposed to be in their formation collateral with the former, and to have struck against the side of the crevice in their descent. A similar phenomenon, and scarcely inferior, occurs in the United States of America, crossing the Cedar Creek in the county of Rockbridge, 100 miles beyond the Blue Ridge, in the higher district of Virginia. This famous arch is described by Mr. Jefferson. It consists of a divided rock of pure lime-stone, leaving a chasm of about ninety feet in width, the walls of which are 230 feet in height. Viewed from a small distance below it has all the appearance of a Gothic arch, and is of such solidity that before the formation of a more convenient road, loaded wagons used to pass over it.

The water-falls of the Andes are numerous, and occasionally very imposing in their appearance. That of Tequendama in the plains of Bogota, perhaps, all things considered, exceeds any other in the known world: the basin which feeds its stream is the plain already alluded to. It is 7465 ft. above the level of the sea, and encircled with lofty mountains, except where the water, aided perhaps by some territorial concussion, has opened for itself a narrow passage. The river Funcha, swelled by numerous feeders, contracts its channel to the breadth of about forty feet; and then suddenly swelling into strength falls at two bounds from a perpendicular height of near 600 feet into a gloomy quebrada: it discharges a prodigious volume of water, and stuns the ear by the roar of its crash, while it raises enormous clouds of thick spray and vapour that continually bedew and enliven the vegetation of the neighbouring regions. The whole landscape combines to soften the horrors of this scenery. Luxuriant trees and herbaceous plants reach to the very edges of the numerous precipices around, and display remarkable freshness of vegetation. The climate is temperate in its vicinity, and fine crops of wheat are seen in all parts of the plain; below, the traveller feels a sensible approach to the ardour of equatorial regions; delightfully relieved, however, by the dashing spray and dews of the water-fall. A singular tradition of the natives respecting the formation of this cataract is thus given by Captain Bonnycastle: 'In remote times, when the sun alone gave the earth light, and the people of the plain of Bogota were savage barbarians, an old man, totally unlike the natives, suddenly appeared amongst them from the east, with a white beard and flowing garments. This was Bochica. He instructed them in agriculture, &c.; and with him came a woman, who, as well as himself, had three names; one of which was Chia; she was very beautiful, very malevolent, and overturned every thing Bochica attempted. By her magic she swelled the rivers and overflowed the plain; so that the people, with the exception of a few who escaped to the mountains, perished in the waters. Bochica, exasperated at her conduct, drove Chia from the earth, and she became the moon. He then, by the mighty force of his arm, broke a passage through the rocks, and constituted the fall of the Tequendama; by which means the lake formed by Chia was drained, and the plain of Bogota rendered more beautiful and fertile than it had been before. The appearance of the plain of Bogota, at this moment, justifies the tradition of its having formerly been a lake. Low summits appear here and there like islets, and the whole plain is rendered marshy by the numerous streams which cross it in every direction.'

A lively idea of the character and grand features of the Andes may be conceived from the account given by the celebrated Humboldt of his journey across that majestic chain: 'The mountain of Quindiu, in the latitude of 4° 36′,' observes this traveller, 'is considered the most difficult passage in the Cordilleras of the Andes. It is a thick uninhabited forest, which, in the finest season cannot be traversed in less than ten or twelve days. Not even a hut is to be seen, nor can any means of subsistence be found. Travellers, at all times of the year, furnish themselves with a month's provision, since it often happens, that by the melting of the snows, and the sudden swell of the torrents, they find themselves so circumstanced that they can descend neither on the side of Carthago nor that of Ibague. The highest point of the road, the Garito del Paramo, is 11,500 feet above the level of the sea. As the foot of the mountain, towards the banks of the Cauca, is only 3,150 feet, the climate there is generally mild and temperate. The path-way which forms the passage of the Cordilleras is only twelve or fifteen inches in breadth, and has the appearance, in several places, of a gallery dug, and left open to the sky. In this part of the Andes, as almost in every other, the rock is covered with a thick stratum of clay. The streamlets which flow down the mountains have hollowed out gullies about twenty feet deep. Along these crevices, which are full of mud, the traveller is forced to grope his passage; the darkness of which is increased by the thick vegetation that covers the opening above. The oxen, which are the beasts of burden commonly used in this country, can scarcely force their way through these galleries, some of which are more than a mile in length; and if, perchance, the traveller meets them in one of these passages, he finds no means of avoiding them but by turning back, and climbing the earthern wall which borders the crevice, and keeping himself suspended by laying hold of the roots which penetrate to this depth from the surface of the ground.

'We traversed the mountain of Quindiu in the month of October, 1801, on foot, followed by twelve oxen, which carried our collections and instruments, amid a deluge of rain, to which we were exposed during the last three or four days in our descent on the western side of the Cordilleras. The road passes through a country full of bogs, and covered with bamboos. Our shoes were so torn by the prickles which shoot out from the roots of these gigantic gramina, that we were forced, like all other travellers who dislike being carried on men's backs, to go bare-footed. This circumstance, the continual humidity, the

length of the passage, the muscular force required to tread in a thick and muddy clay, the necessity of fording deep torrents of icy water, render this journey extremely fatiguing; but, however painful, it is accompanied by none of those dangers with which the credulity of the people alarms travellers. The road is narrow, but the places where it skirts the precipices are very rare.

'When travellers reach Ibague, and prepare to cross the forests of Quindiu, they pluck in the neighbouring mountains several hundred leaves of the vijao, a plant of the family of the bananas, which forms a genus approaching to the thalia, and which must not be confounded with the heliconia bibai. These leaves, which are membranous and silky, like those of the musa, are of an oval form, two feet long and sixteen inches broad. Their lower surface is a silvery white, and covered with a farinaceous substance, which falls off in scales. This peculiar varnish enables them to resist the rain during a long time. In gathering these leaves an incision is made in the middle rib, which is the continuation of the foot-stalk, and this serves as a hook to suspend them, when the moveable roof is formed. On taking it down they are spread out, and carefully rolled up in a cylindrical bundle. It requires about a hundred weight of leaves to cover a hut large enough to hold six or eight persons. When the travellers reach a spot in the midst of a forest where the ground is dry, and where they purpose to pass the night, the cargueros lop a few branches from the trees, with which they make a tent. In a few minutes this slight timber-work is divided into squares, by the stalks of some climbing plant, or the threads of the agavè, placed in parallel lines, twelve or thirteen inches from each other. The vijao leaves meanwhile become unrolled, and are now spread over the above work, so as to cover it like the tiles of a house. These huts, thus hastily built, are cool and commodious. If, during the night, the traveller feels the rain, he points out the spot where it enters, and a leaf is sufficient to obviate the inconvenience. We passed several days in the valley of the Boquia, under one of these leafy tents, which was perfectly dry amidst violent and incessant rains.'

Excellent roads have been cut with great labour in the neighbourhood of Chimborazo, one of which is 1000 miles in length; and similar labours of the ancient incas of Peru may be found throughout that province. Over the Rio Desaguadero, in Buenos Ayres, is a singular road-way, formed of rushes, which is attributed to Capac Yupanqui, the fifth inca. He is said to have caused four large cables to be made of the long grass of the higher regions of the Andes; two of which were first stretched across the stream, and bundles of dry rushes and flags fastened upon them; over these the other two cables were stretched and covered with similar materials, until a safe bridge, of 100 yards in length and five in breadth, was constructed for the passage of his army to the conquest of Charcas. It was repaired, by a Peruvian law, every six months; and the Spaniards, since their possession of the country, have kept it in good condition. In the more difficult roads the aid of the mule is required. These are sometimes full of holes, from two to three feet deep, in which the mules set their feet, and draw their bellies and their rider's legs along the ground with the utmost caution. Thus they form a species of steps, without which the precipices would frequently be impassable. If the mule, which rarely happens, should accidentally place his foot between two of these holes, or in a wrong situation, the rider falls at whatever peril. Where these holes are wanting, and the tracks are steep and slippery through incessant rains, the traveller is preceded by Indians, who dig small trenches along the path with a peculiar species of spade. On other occasions of a smooth and steep descent, the mules seem to feel the pressing danger, and pause at the top of the eminence, as if to ascertain the best mode of procedure. The animal then carefully closes its fore feet, and stretching them out straight, draws its hinder legs in some degree under its body, and glides down the path with inconceivable rapidity. The rider in this instance must keep himself fast in his saddle, and impose no restraint upon his mule, for the least possible movement, by destroying the equilibrium, may precipitate both down the steep sides of the rocks. Whenever all is thus committed to themselves, the mules will exactly follow the different windings of the path, and pass the greatest irregularities with safety.

The central group of mountains, in the province of Quito, have hitherto excited in travellers a degree of interest unequalled in any other part of this amazing chain. In this latitude the great chain divides itself into two prodigious ridges, enclosing a plain of immense extent stretching from 0° 13′ to 3° of south latitude. This plain is however interrupted by the bulging summits of inferior mountains of various altitudes; forming rather a succession of hills and valleys, the loftier parts of which lie 13,900 feet above the level of the sea. This plain, embosomed within the walls and bulwarks of nature, forms a beautiful central kingdom overspread with towns and villages, and tempered by a climate the most delightful of any in the new world. The city of Quito stands to the north. Every town has a large square in the centre, from which the streets proceed in right angles, and give the whole the appearance of an extensive garden. The suburbs are delightfully varied and rendered beautiful by the appearance of every species of vegetation and horticulture. Since the last earthquake the climate has undergone considerable variation, and the thermometer, which according to Humboldt before stood at fifteen or sixteen degrees, now stands on an average from four to ten degrees of Reaumur.

The approach to the Andes from the western coasts has always been admired. The road lies through the most beautiful forests, the foliage of which is sweetened by all the charms of diversity and heightened by the most lovely colouring of nature. As the traveller advances an awful sublimity pervades the mind, and the wide interstices and tremendous chasms, together with the cataracts that shelve down their sides from

an amazing altitude, filling the distant view, overwhelm him with astonishment and admiration. Still as he advances new dangers appear on every side; the impetuous torrents that are crossed by frail and precarious bridges formed of matted grass; and even the best roads lead along the edge of tremendous precipices, and are inaccessible except to a single mule, to whose sagacity his life must be committed.

The enormous mountains of Casitagua, Pichincha, Atacazo, Corazan, Chimborazo, Cunambay, Carguirazo, and Ilinissa, rear their lofty heads to the west of the great plain already alluded to; and Tunguragua, Cotopaxi, Quelendama, Ruminaui, Passuchoa, Antisana, Cayambe, and Guamani, stand on the east; Capa Urcu, or El Altar, is said to have been once more elevated than even Chimborazo. This latter mountain has been geometrically ascertained to be nearly 22,000 feet in altitude, and has been thought the highest point of elevation on the surface of the globe. The top is of a conical form, and to surmount it many unsuccessful efforts have been made. Humboldt accomplished more than any of his predecessors; for he succeeded in scaling a ridge of volcanic rocks within 240 toises of its summit, when the extreme tenuity of the air, and the fissures by which he was surrounded, prevented the possibility of any further effort. The fogs were intense, every living creature was far below, the blood streamed from his lips and various parts of his face; and he was compelled to retire. The road from Guayaquil to Quito, on the northern declivity of this mountain, leads through the grandest scenery, and approaches to the regions of perpetual winter.

Cotopaxi, between the mountains of Ruminani and Quelendama, twelve leagues from Quito, is the next remarkable mountain of the Andes, and the highest volcano in the world. It is of conical shape and is 18,898 feet in altitude. The first eruption was at the time when the Spanish government subjugated these regions. In 1743 it threw up volumes of flame followed by immense torrents of water that inundated the whole country, and, entering the river near Latacunga, caused it immediately to burst its banks and overflow the plains: the eruption succeeded by these torrents continued for three days, when the latter slowly diminished; but the flames continued to rise for some time, and emitted through the crevices of the mountain a most brilliant nocturnal illumination of the country. In 1768 the whole summit of the mountain was so heated as to discharge at once all its snow; and poured at the same time such volumes of ashes as obscured the light of the sun at Hambato till three o'clock in the afternoon. The eruption was heard at Guayaquil, a distance of 150 miles, like the roaring of successive discharges of artillery. Masses of scorified rocks are still thrown frequently into the surrounding plains. Humboldt tried to reach the top of the mountain, but in vain. The crater appeared like a wall of black rock round the top of this mountain.

Pichincha is inferior in elevation to Cotopaxi, rising only to 15,939 feet from the level of the the sea. It is a volcano, the crater of which is an enormous gulf three miles in circumference, and has three principal peaks, which overhang its edge. When Condamine examined it in 1735, the fires were extinct, and the surrounding ridges covered with snow. In 1802 when Humboldt exam ned it, he found many appearances of volcanic activity. The surrounding peaks were naked, the heat having melted the snow; and the minor circumference of the crater was black, occasionally emitting smoke and flames. He prostrated himself on the utmost projection of one of the overhanging peaks to look into the abyss below, and at the depth of about 600 yards from the top several inferior mountains seemed to rise, and he thought the bottom of the crater of equal altitude with the plain of Quito.

Cayambe Ureau rises to an elevation of 19,480 feet from the level of the sea, in the shape of a truncated cone, and is crossed by the equinoxial line. El Corazan also hides its summit in the region of frost and snow: it is 15,795 feet in altitude, and its summit is in the shape of a heart. Ilinissa and Ruminani cross the equator, and stand east and west of the Andes, to the height of 17,000 feet, joining each other by a transverse chain, called Alto de Tiopullo. A tumulus appears on the summit of the chain, supposed to have been the burial-place of some distinguished chief; also the building, supposed to be an ancient Peruvian palace, and traditionally called the palace of Callo, nine miles from the crater of Cotopaxi, and thirty from Quito: its form is square; the sides are 100 feet in length, with four great door-ways, and eight chambers; the walls are three feet in thickness, and the whole, being in a good state of preservation, affords an exquisite specimen of native architecture. The volcano of Sangai or Mecas, 17,131 feet in altitude, is the most southerly mountain of Quito. Continual fires are seen to rise from its summits, which are covered with snow; and it is remarkable for the loud crashing sounds which it constantly emits, and which are heard, according to Ulloa, at the distance of forty leagues. From the rushing nature of the sounds some have thought them to be caused by imprisoned wind; but the rattling and crashing noise which is heard on other occasions seems to proceed from internal convulsions. The liquid mud, already alluded to, containing many thousands of dead fish, is among the more remarkable productions of this volcano. El Altar or Altair rises to the height of 17,256 feet, and is joined by a lofty desert to another peak called Collanes. Seven leagues north of this is the volcano Tunguragua, famous for its hot springs, which supply several hot baths erected in the neighbourhood. It is said by some travellers to be 16,500 feet in altitude. An irruption from this mountain entirely overwhelmed the town of Riobamba. Canguirazo, north-west of Tunguragua, rises 15,640 feet above the level of the sea. We have given the heights of the above mountains from a popular authority, but various estimates have been formed respecting them.

In the year 1734 M. Bouguer, and other mathematicians of France and Spain, were com-

missioned from their respective governments to make observations on the figure of the earth in this part of the Andes; a circumstance which supplied numerous interesting particulars. On their arrival at the kingdom of Quito they determined to continue the series of the triangles for measuring an arch of the meridian to the south of that city: the company accordingly divided themselves into two bodies, consisting of French and Spaniards, and each retired to the part assigned them. Don George Juan and M. Godin, who were at the the head of one party, went to the mountain of Pambamarca; while M. Bouguer, de la Condamine, and Don Ulloa, together with their assistants, climbed up to the highest summit of Pichincha. Both parties suffered extremely, as well from the severity of the cold as from the impetuosity of the winds, which on these heights blow with incessant violence; difficulties the more painful, as they had been little used to such sensations. Thus in the torrid zone, nearly under the equinoctial, where it is natural to suppose they had most to fear from the heat, their greatest pain was caused by the excessiveness of the cold. Their first scheme for shelter and lodging, in these uncomfortable regions, was, to pitch a field-tent for each company; but on Pichincha this could not be done, from the narrowness of the summit; they were therefore obliged to be contented with a hut so small that they could hardly all creep into it. Nor will this appear strange, if the reader considers the bad disposition and smallness of the place, it being one of the loftiest crags of a rocky mountain, 100 fathoms above the highest part of the desert of Pichincha. Such was the situation of their mansion, which, like all the other adjacent parts, soon became covered with ice and snow. The ascent up this stupendous rock, from the base, or the place where the mules could come, to their habitation, was so craggy as only to be climbed on foot; and to perform it cost them four hours continual labour and pain, from the violent efforts of the body and the subtilty of the air; the latter being so thin, and probably overcharged with the lighter respirable gases, as to render respiration difficult. The strange manner of living to which our artists were reduced during the time they were employed in a geometrical mensuration of some degrees of the meridian, may not prove unentertaining to the reader; and therefore, the following account is given as a specimen of it: The desert of Pichincha, both with regard to the operations performed there and its inconveniences, differing very little from others, an idea may be very easily formed of the fatigues, hardships, and dangers, to which they were continually exposed, during the time they were prosecuting the enterprise, with the conduct of which they had been honoured. The principal difference between the several deserts consisted in their greater or lesser distance from places where they could procure provisions, and in the inclemency of the weather, which was proportionate to the height of the mountains and the season of the year.

Our philosophers generally kept within their hut. Indeed, they were obliged to do this on account of the intenseness of the cold, the violence of the wind, and their being continually involved in so thick a fog that an object at six or eight paces was hardly discernible. When the fog cleared up, the clouds by their gravity moved nearer to the surface of the earth, and on all sides surrounded the mountains to a vast distance, representing the sea, with their rock, like an island, in the centre of it. When this happened, they heard the horrid noises of the tempests, which then discharged on Quito and the neighbouring country. They saw the lightnings issue from the clouds, and heard the thunders roll far beneath them; and, whilst the lower parts were involved in tempests of thunder and rain, they enjoyed a delightful serenity; the wind was abated, the sky clear, and the enlivening rays of the sun moderated the severity of the cold. But their circumstances were very different when the clouds rose; their thickness rendered respiration difficult, the snow and hail fell continually, and the wind returned with all its violence, so that it was impossible entirely to overcome the fears of being, together with their hut, blown down the precipice, on whose edge it was built, or of being buried under it by the daily accumulations of ice and snow. The wind was often so violent in these regions that its velocity dazzled the sight, whilst their fears were increased from the dreadful concussions of the precipice, caused by the fall of enormous fragments of rocks. These crashes were the more alarming, as no other noises are heard in these deserts; and during the night their rest, which they so greatly wanted, was frequently disturbed by such sudden sounds. When the weather was fair near their hut, and the clouds gathered about some of the other mountains which they had selected for their observations, so that they could not make all the use they desired of this interval of good weather, they left their hut to exercise themselves. Sometimes they descended to a small distance; and at other times amused themselves with rolling large fragments of rocks down the precipice; and these frequently required the joint strength of them all, though they often saw the same effected by the mere force of the wind. But they always took care, in their excursions, not to go so far out, but that, on the least appearance of the clouds gathering about their cottage, which often happened very suddenly, they could regain their shelter. The door of their hut was fastened with thongs of leather, and on the inside not the smallest crevice was left unstopped; besides which, it was very compactly covered with straw; but, notwithstanding all their care, the wind penetrated through. The days were often little better than the nights; and all the light they enjoyed was that of a lamp or two, which they kept continually burning. Though their hut was small, and crowded with inhabitants, besides the heat of the lamps; yet the intenseness of the cold was such, that every one of them was obliged to have a chafing dish of coals. These precautions would have rendered the rigour of the climate supportable, had not the imminent danger of perishing, by being blown down the precipice, roused them, every time it snowed, to encounter

the severity of the outward air, and sally out, with shovels, to free the roof of their hut from the masses of snow which were gathering on it. Nor would it, without this precaution, have been able to support the weight. They were not indeed without servants and Indians; but these were so benumbed with the cold, that it was with great difficulty they could get them out of a small tent, where they kept a continual fire. So that all our artists could obtain from them, was to take their turns in this labour; and even then they went very unwillingly about it, and consequently performed it slowly.

The reader may easily judge what our philosophers suffered from the asperities of such a climate. Their feet were swelled; and so tender, that they could not even bear the heat; and walking was attended with extreme pain. Their hands were covered with chilblains; their lips swelled and chapped, so that every motion in speaking, or the like, drew blood; consequently they were obliged to strict taciturnity and little disposed to laugh, as, by causing an extension of the lips, it produced such fissures as were very painful for two or three days after. Their common food in this inhospitable region was a little rice boiled with some flesh or fowl, procured from Quito; and, instead of fluid water, their pot was filled with ice; they had the same resource with regard to what they drank; and while they were eating, every one was obliged to keep his plate over a chafing-dish of coals, to prevent his provisions from freezing. The same was done with regard to the water. At first they imagined the drinking strong liquors would diffuse a heat through the body, and consequently render it less sensible of the painful sharpness of the cold; but, to their surprise, they felt no manner of strength in such liquors, nor were they any greater preservative against the cold than the common water. At the same time they found it impossible to keep the Indians together. On their first feeling of the climate, their thoughts were immediatety turned on deserting their masters. The first instance they had of this kind was so unexpected, that had not one of a better disposition than the rest, staid and acquainted them of their design, it might have proved of very bad consequence. The affair was this: there being on the top of the rock no room for pitching a tent for the Indians, they used every evening to retire to a cave at the foot of the mountain; where, besides a natural diminution of the cold, they could keep a continual fire; and, consequently, enjoy more comfortable quarters than their masters. Before they withdrew at night, they fastened, on the outside, the door of the hut, which was so low that it was impossible to go in or out without stooping; and as every night the hail and snow which had fallen formed a wall against the door, it was the business of one or two of the Indians to come early and remove this obstruction. For though the negro servants were lodged in a little tent, their hands and feet were so covered with chilblains, that they would rather have suffered themselves to have been killed than move. The Indians therefore came constantly up to dispatch this work betwixt nine and ten in the morning; but they had not been there above four or five days, when they were not a little alarmed to see ten, eleven, and twelve o'clock come, without any news of their labourers; when they were relieved by the honest servant mentioned above, who had withstood the seduction of his countrymen, and informed his masters of the desertion of the four others. As soon as the snow was cleared away from the door, they despatched the Indian to the corregidor of Quito, who with equal despatch sent other Indians, threatening to chastise them severely if they were wanting in their duty. But the fear of punishment was not sufficient to induce them to support the rigour of this situation; for within two days they also deserted. The corregidor therefore, to prevent any other inconvenience, sent four Indians under the care of an alcade, and gave orders for their being relieved every fourth day.

Our philosophers spent no fewer than twenty-three tedious days on this rock, without any possibility of finishing their observations of the angles; for when it was fair and clear weather with them, the others, on whose summits were the signals which formed the triangles for measuring the degrees of the meridian, were hid in the clouds; and when those were clear, Pichincha was involved in clouds. It was therefore necessary to erect their signals in a lower situation, and in a more favourable region. This, however, did not produce any change in their habitation till the beginning of December, when, having finished the observations which particularly concerned Pichincha, they proceeded to others; but with no abatement either of inconveniences, cold, or fatigue; for the places where they made their observations being necessarily on the highest parts of the deserts, the only respite in which they enjoyed some little ease was during the short interval of passing from one to the other. In all their stations subsequent to that on Pichincha, during their fatiguing mensuration of the degrees of the meridian, each company lodged in a field-tent, which, though small, they found less inconvenient than the hut on Pichincha; though at the same time they had more trouble, being oftener obliged to clear it from the snow, as the weight of it would otherwise have demolished the tent. At first, indeed, they pitched it in the most sheltered places; but on taking a resolution that the tents themselves should serve for signals, to prevent the inconvenience of having others of wood, they removed them to a more exposed situation, where the impetuosity of the winds sometimes tore up the piquets, and blew them down. Though this mountain is famous for its great height, it is considerably lower than the mountain of Cotopaxi: but it is impossible to conceive the coldness of the summit of the last mentioned mountains from that felt on this; since it must exceed every idea that can be formed by the human mind, though they are both seated in the midst of the torrid zone. In all this range of mountains, there is said to be a constant inferior boundary, beyond which the snow never melts; this boundary, in the midst of the torrid zone, is said by some to be 2,434 fathoms above the level of the sea; by others, only 2,400 feet. The snow indeed falls much lower, but then it is

subject to be quickly melted. Considerable differences in measuring heights are observed in different calculators: the peak of Teneriffe, which, according to the calculations of Varenius, is three miles and three-quarters, or 19,800 feet; according to those of Dr. Heberden, it is only 15,396 feet; and according to those of M. Feuille, is no more than 13,128 feet. From these specimens, we can scarcely avoid concluding, that all the methods hitherto invented for calculating the exact height of mountains are insufficient.

The highest deserts of the Andes are in the north, called Paramos, and in Peru Punas; but so acute and peculiar is the cold of the air in these places, as rather to pierce the vitals than affect the exterior feelings. It is no uncommon circumstance to meet with the bodies of travellers who have perished in the cold, whose faces have the horrid appearance of laughter, owing to the contraction of the muscles at the period of dissolution. The pine lingers last of the more stately tribes of vegetables, accompanied by a low species of moss. It is found 13,000 feet in altitude above the level of the sea. Numerous orders of the larger trees appear progressively at the height of between 10,000 and 9,000 feet in descending. At the height of 9,200 feet is found the oak, which in the equatorial regions never descends below that of 5,500. It is however said to be found in the neighbourhood of Mexico at the height of only 2,620 feet. European grains flourish best between the altitude of 6,000 and 9,000 feet. Wheat under the equator will seldom spring up below the elevation of 4,500 feet, or ripen above that of 1,080. Humboldt says there are very fine harvests of wheat near Victoria, in the Caraccas province, at 1,640 and 1,900 feet above the level of the sea. At Cuba wheat crops will flourish and ripen at a small elevation. Rye and barley, from their botanical constitution, are capable of resisting cold better than wheat, and consequently of ripening in a superior altitude. Maize is cultivated in the same climate as the banana, but will flourish 9,000 feet above the level of the sea. Oranges, pine-apples, and every diversity of delicious fruits and vegetables, are found on the lower grounds of the Andes within the tropics. Cassava, maize, cacao, coffee, sugar, cotton, and indigo, are cultivated with great success. Indigo and cacao, however, require immoderate heat to ripen them. Cotton and coffee require a more temperate clime. Sugar arrives at a superior degree of perfection in the more temperate regions of the kingdom of Quito.

For further information we refer our readers, as the best authority, to HUMBOLDT, and *Journal de Physique*, vol. LIII. for 1801.

ANDETRIUM, ANDRETRIUM, ANDECRIUM, or ANDRECIUM; an inland town of ancient Dalmatia, situated near Salonæ, on a strong and inaccessible rock, surrounded with deep valleys and rapid torrents; now Clista. This town withstood, for a considerable time, the Romans under Tiberius.

ANDEVOURANTE, a large river flowing through the country of the Betalimenes, on the east coast of Madagascar. On its banks is situated the chief town, bearing the same name, and able, it is said, to furnish 10,000 fighting men.

ANDICOTTA, a town of Hindostan, and province of Malabar, thirty-eight miles S. S. E. of Calicut. Lat. 10° 54′ N., long. 76° 9′ E.

ANDIRA or ANGELYN, in botany, a tree in Brazil, the wood of which is hard and proper for building. According to Gmelin, andira is a genus of the class diadelphia; order decandria: its characters are: CAL. urceolated, quindentated; COR. two petals; fruit a fleshy pod, ovate, furrowed, and containing a single seed.

ANDIRA, or ANCIRA-GUACU, in zoology, a kind of bat in Brazil, nearly as big as our pigeons; called the horned bat, from a sort of excrescence above the beak. The inhabitants reckon the tongue and heart of this animal poisonous; and it sucks blood with avidity.

ANDIRON. It is contended by some that this word should be written hand or end-iron; by others it is considered a corruption of brand-iron. Irons at the end of a fire-grate, in which the spit turns; irons used when there is no grate for wood to burn on.

If you strike an entire body, as an *andiron* of brass, at the top, it maketh a more treble sound, and at the bottom a baser. *Bacon.*

If we place a needle touched at the foot of tongs or *and-irons*, it will obvert or turn aside its lillie or north point, and confirm its cuspis or south extreme unto the *and-iron*. *Brown's Vulgar Errors.*

ANDLAU, a town of Lower Alsace in France, in the department of the Lower Rhine, and arrondissement of Bar. The barons of Andlau held the town as a fief, from the abbess of the convent here, which was appropriated to ladies of the rank of noblesse only; the abbess had the title of princess of the empire. The abbey was immediately under the government of the pope, but was suppressed at the revolution. Population 2185. Eighteen miles S. S. W. of Strasburg. Long. 7° 30 E., lat. 48° 24′ N.

ANDLAU, a river of Lower Alsace in France, which rises in the Vosges mountains, and falls into the Ill, near Figersheim.

ANDOCIDES, an Athenian orator, four of whose orations are extant; upon which Harpocrates wrote his Lexicon. When Alcibiades was tried for demolishing the statues of Mercury, Andocides acknowledged the crime, and accused his accomplices. His style is plain and simple, and entirely destitute of ornament.

ANDOMADUNUM, or ANTEMATUNUM, in ancient geography, a city of Gallia Belgica; now called Langres in Champagne, situated on an eminence, as the termination dunum signifies, on the borders of Burgundy, at the springs of the Maine.

ANDONY, a river of western Africa, in the country of Calabar or Waree, falling into the sea in latitude 4° 30′ north. It has a small town of the same name at its mouth.

ANDORA, a small fortified town of Genoa, which produces excellent wine.

ANDORINHA, in ornithology, the Portuguese name for the Brazilian swallow, or tapera.

ANDORRE, a fruitful valley on the borders of Spain, in the arrondissement of Foix, and

department of the Ariege. It contains a considerable quantity of excellent pasture land, and extensive sheep-walks; it is noted also for its iron works, the fuel for which is supplied from the spacious forests in the neighbourhood. The little village of Andorre is nine miles north of Urgel in Catalonia.

ANDOVER, a borough and market town in Hampshire, pleasantly situated on the Ande, on the edge of the downs. It is a great thoroughfare between London and Salisbury; and sends two members to parliament. The market is on Saturday, and well stocked with provisions. On two hills in the neighbourhood are the appearances of Roman encampments. The town was incorporated by queen Elizabeth. It is governed by a bailiff, a steward, a recorder, ten councillors, and twenty-two burgesses, who choose the bailiff annually, and he appoints two serjeants-at-mace to attend him. It lies ten miles north by west of Winchester, and sixty-five west by south of London. Fairs are held on Thursday and Friday, the third week in Lent, May 12, and Nov. 6. It carries on a manufacture of shalloons, and a large trade in malting.

ANDOVER, a town of Massachusetts, North America, in Essex county, where is an excellent academy, called Phillips Academy, and manufactures of paper and gunpowder. It is situated on the Shawsheen, twenty miles W.S.W. of Newbury Port, and twenty-two N. N. W. of Boston.

ANDOVER, a town of New Jersey, near the source of Pequest river, five miles S. S. E. from New Town, and sixteen from Wolpack. Also the name of two other small towns of the United States, one in New Hampshire, the other in Vermont County.

ANDRACHNE, BASTARD ORPINE: a genus of the gynandria order, and monœcia class of plants; and in the natural order of tricoccæ. The characters are: CAL. five-leaved; COR. none; STYL. three: PIST. germ superior and globose; stigmas globose; PERICAR. a capsule globose-trilobate, three-celled, cells bivalved, of the size of the calyx; SEEDS in pairs, rounded on one side, triangular and obtuse on the other. 1. A. arborea has a tree-like stalk, native of Campeachy. It has never flowered in Britain. 2. A. fruticosa, or shrubby bastard orpine, a native of China and some places of America. 3. A. Jamaicensis, a species raised by Mr. Millar from seeds sent from Jamaica. It agrees in general with the first sort; but the leaves are somewhat like the laurel, only much larger. 4. A. telephoides, or herbaceous trailing andrachne, a low plant, a native of Italy and the Archipelago.

ANDRACHNE is also a name given by the ancients, sometimes to a tree of the arbutus or strawberry tree kind, and sometimes to the herb purslain. Some of the later Latin writers have also called it porcala, and some of the later Greeks cairabotanon.

ANDRACIO, or ANDRACY, a town of Majorca, about nine miles south-west of Bannatatur, rebuilt by James I. It possesses a parish-church, and has a harbour about two miles distant.

ANDRADA (Diego de Payva, d'), or ANDRADIUS, a learned Portuguese, born at Conimbria, who distinguished himself at the council of Trent, where king Sebastian sent him as one of his divines. He died in 1575, aged 47; and wrote, 1. Orthodoxarum Explicationum, Lib. x. 4to. Venet. 1564. 2. Defensio Tridentinæ Fidei Catholicæ quinque Libris comprehensa adversus Hæreticorum Calumnias et præsertim Martini Chemnitii; in answer to Chemnitz' Examen Concilii Tridentini. 3. De Conciliorum Autoritate. 4. Three Volumes of Sermons.

ANDRÆA, in botany, a very curious distinct genus of mosses, so named by Ehrhart, in honour of his friend John Gerhard Reinhard Andreæ. Class, cryptogamia; order, musci. Its generic characters are: ANTH. three to seven, clearly cylindrical, somewhat stalked, interspersed with numerous, jointed, succulent threads, swelling upwards, taller than themselves: SHEATH of several imbricated concave scales, shorter than the fruit-stalk, which is cylindrical, scarcely longer than the capsule, tumid at its base: PERICAR. capsule on a turbinate fleshy base, ovate, somewhat quadrangular, of four equal oblong valves: column cylindrical, as long as the valves: lid minute, conical, permanent, confining the points of the valves: Veil membranous, pellucid, bell-shaped, torn irregularly from its base, and finally turned to one side, crowned with the style: STYLE slightly prominent: SEEDS minute, spherical, brown. Its species are all natives of Britain, and are 1. A. alpina, Alpine andræa. 2. A. rupestris, rock andræa. 3. A. rothii, black mountain andræa. 4. A. nivalis, tall, slender, andræa.

ANDRAGHIRA, a river of Sumatra, upon which the Dutch have a factory. It rises from a lake in the native kingdom of Menancabow, whence it issues by the name of Ayer Ambelan, and falls into the sea on the east coast, in about latitude 0° 30′ south. It is navigable to a great distance from the mouth; and, owing to the flatness of the country, the tide flows far up from the sea.

ANDRANOTOMIA, in anatomy; from *ανηρ*, vir, and *ανατομη*; the dissection of a male subject.

ANDRANTSAIES, a people of the interior of Madagascar, south of the Ancoves. They are a pastoral race; and, being cowardly and unwarlike, purchase peace by a tribute of cattle. In this part of Madagascar dwarfs are very common, which has given occasion to some travellers to represent them as a nation of dwarfs.

ANDRAPHAX, in botany; *ανδραφαξ*, stinking orache; the chenopodium vulgare of Linnæus.

ANDRAPODISMUS, in ancient writers, the selling of persons for slaves.

ANDRAPODISTES, a dealer in slaves, more particularly a kidnapper, who steals men or children to sell them; a crime the Thessalians were noted for.

ANDRAPODOCAPELI, in antiquity, a kind of dealers in slaves. The andrapodocapeli were accustomed to take off moles, &c. from the faces of the slaves they kept for sale, by rubbing them with bran. At Athens several places in the forum were appointed for the sale of slaves.

Upon the first of every month, the merchants brought them into the market and exposed them to sale, whilst the crier, standing upon a stone erected for that purpose, collected the people together

ANDRARUM, a town of Sweden, in South Gothland, ten miles south of Christianstadt, where there is the greatest alum-works in the kingdom.

ANDRASTADT, or ANDRE, ST. a town of Lower Carinthia, in Austria, also called Lavant, from a river of that name which flows through it. It belongs to the archbishop of Saltzburg, and is the seat of a provost and bishop, who was formerly a prince of the empire, and who takes the title of bishop of Lavant, at St. Andre, twenty miles E. N. E. of Clagenfurt, and thirty-two south-east of Mahran.

ANDRE (Major J.), an adjutant-general in the British army, originally a merchant's clerk, and possessed of some literary ability, being the author of an ingenious poem, entitled The Cow Chase. Employed to negociate the defection of the American General Arnold and his troops, he was apprehended in disguise on the 23d September, 1780, within the American lines, and sent prisoner to General Washington, who submitted his case to the examination and decision of a board of general officers, consisting of Major-general Green, Lord Stirling, the Marquis de la Fayette, &c. Major Andre was examined before them, and the particulars of his conduct enquired into; when it was determined that he ought to be considered as a spy from the enemy; and that, agreeable to the law and usage of nations, he should suffer death. Major Andre was hanged at Tappan, in the province of New York, on the second of October. He met his fate with great firmness, after having in vain solicited a more military death. A monument is erected to his memory in Westminster Abbey.

ANDREÆ (John Gerhard Reinhard), an ingenious naturalist of Hanover, was born in 1724. He travelled during his father's life through Prussia, Holland, Germany, and Switzerland; and also visited England. In 1748 he returned to Hanover, and on his father's death he succeeded him in the business of an apothecary. He published a Tour in Switzerland 1776, 4to.; and a Treatise on the several kinds of earth in Hanover 1779. He died in 1793.

ANDREAS (James), an eminent German reformer, born in the duchy of Wirtemberg, in 1528. In 1546, he was appointed minister of the church of Stutgard. He was at the diet of Ratisbon, and was one of the secretaries at the conference at Worms. He also assisted at the diet of Augsburg; and was soon after appointed chancellor and rector of the university of Tubingen. He died in 1590. He was the author of several learned treatises, particularly one on Concord.

ANDREAS (John), a celebrated canonist in the fourteenth century, was born at Mugello near Florence. He became professor of canon law at Padua, Pisa, and afterwards at Bologna. Andreas had a daughter named Novella, whom he used to send to read lectures to the students when he was himself unable; and lest her beauty should prevent the attention of the hearers, she had a little curtain drawn before her. The first work of Andreas was his Gloss upon the Sixth Book of the Decretals, which he wrote when he was very young. He wrote also Glosses upon the Clementines; and a commentary In Regulas Sexti, which he entitled Mercuriales, because he inserted his Wednesday's disputes in it. He enlarged the Speculum of Durant in 1347; and died of the plague at Bologna in 1348, after he had been a professor forty-five years: he was buried in the church of the Dominicans. Andreas has been called Archidoctor decretorum, and in his epitaph, Rabbi doctorum; lux, censor, normaque morum; Rabbi of the doctors, the light, censor, and rule of manners. Pope Boniface called him lumen mundi, the light of the world.

ANDREAS (John), was born a Mahommedan, at Xativa in the kingdom of Valentia, and succeeded his father as alfaqui of that city. He was converted to the Christian religion by hearing a sermon in the great church of Valentia on the day of assumption, in 1487. Upon this he desired to be baptized; and, in memory of the calling of St. John and St. Andrew, he received the name John Andreas. After this he was made a canon; and at the desire of Martin Garcia, bishop of Barcelona, undertook to translate from the Arabic, into the language of Arragon, the whole law of the Moors. Having finished this undertaking he composed his famous work of The Confusion of the Sect of Mahomet.

ANDREAS, St. the name of a small group of islands in the gulf of Venice, north of Ragusa, to which state they formerly belonged. The principal island contains a small town of the same name.

ANDREASBERG, a mining town in the principality of Grubenhagen, in the Hartz, Hanover, near which is a valuable silver mine, employing 130 hands; and also mines of iron and cobalt, to which water is supplied from an ingeniously-constructed reservoir. Population in 1810, 3359. Ten miles S. S. E. of Goslar.

ANDREINI (Isabella), a native of Padua, one of the best Italian comedians, who flourished towards the beginning of the seventeenth century. The Intenti of Pavia admitted her as a member of their society. Her poetic effusions were much admired, especially by cardinal Aldobrandini. Just before her death she visited Paris, where she attracted great attention, and was favourably received at court, but died on her return at Lyons in 1604. Besides her sonnets, madrigals, songs, and eclogues, there is a pastoral of hers entitled Myrtilla, and Letters, printed at Venice in 1610.

ANDRENA, in entomology, according to Fabricius, a division of the genus apis, consisting of those insects of this tribe which have the tongue three-cleft.

ANDREOLITE, in mineralogy, cross-stone; a species of stone of the zeolite family.

ANDREOSSY ISLAND, an island so named by the French, twelve or thirteen miles long, on the south-west coast of New Holland, near the mouth of Buonaparte's gulf.

ANDREW, ST. the apostle, born at Beth-

saida in Galilee, brother to Simon Peter. He had been a disciple of John the Baptist, and followed Jesus upon the testimony given of him by the Baptist. His history, so far as it is recorded in the Gospels, we need not here repeat. Scythia is said to have been subsequently the sphere of this apostle's labours. According to Eusebius, after he had planted the gospel in several places, he came to Patræ in Achaia, where, endeavouring to convert the proconsul Ægeas, he was by that governor's orders scourged, and crucified. Both the Greek and Latin churches agree in celebrating his festival on the thirtieth of November. His body, which is said to have been embalmed, and decently interred at Patræ by a lady of quality, was afterwards removed to Constantinople by Constantine the Great, and buried in the church which he built to the honour of the apostles.

ANDREW, ST. a town of Germany. See ANDRASTADT.

ANDREW, ST., KNIGHTS OF, an order of knights, more usually called the order of the thistle. See THISTLE. The knights of St. Andrew form also an order instituted by Peter the Great of Muscovy in 1697, the badge of which is a golden medal; on one side whereof is represented St. Andrew's cross, with these words, Tzar Pierre monarque de tout la Russie: it is suspended by a blue ribbon from the right shoulder.

ANDREW'S CROSS, ST. one in form of the letter X. See CROSS.

ANDREW'S DAY, ST. in ecclesiastical history, a festival of the church, celebrated on the thirtieth of November, in honour of the apostle St. Andrew.

ANDREWS (Lancelot), bishop of Winchester, was born at London in 1555, and educated at Cambridge. He was first bishop of Chichester, then of Ely, and in 1618 was raised to the see of Winchester. He was considered one of the best preachers and completest scholars of his age. Being once at dinner at court, king James asked aloud, Whether he might not take his subjects' money when he needed it, without all this formality of parliament? Neale, bishop of Durham, replied, 'God forbid you should not; your majesty is the breath of our nostrils.' On which the king said to the bishop of Winchester, 'Well, my lord, what say you?' 'Sir,' replied the bishop, 'I have no skill of parliamentary cases.' The king answered, 'No puts-off, my lord; answer me presently.' 'Then, Sir,' said he, 'I think it lawful for you to take my brother Neale's money, for he offers it.' This great prelate died at Winchester-house in 1626, aged seventy-one, and was buried in St. Saviour's church. Milton, at seventeen years of age, wrote a beautiful Latin elegy on his death. Bishop Andrews had, 1. A share in the translation of the Bible, from Genesis to 2 Kings, inclusively. He also wrote, 2. Tortura Torti, in answer to a work of cardinal Bellarmine, in which that prelate assumed the name of Matthew Tortus. 3. A Manual of Private Devotions: and, 4. A Manual of Directions for the Visitation of the Sick: besides Sermons and Tracts, in English and Latin, published after his death.

ANDREWS (James Pettit), a miscellaneous writer, was born at Newbury, in Berks, in 1737, and died at Brompton in 1797. He wrote, 1. A Pamphlet in behalf of the Chimney-sweepers in 1788. 2. Anecdotes Ancient and Modern, with Observations, 8vo. 1789; and a Supplement to it, 1790. 3. History of Great Britain, with Notes, &c. 4to. 1794. 4. An Account of Saxon Coins found in Kintbury Church-yard, Berks. 5. The Account of Shaw, in Mr. More's Berkshire Collections. 6. The Savages of Europe, a novel translated from the French. Mr. A. also contributed several papers to the Archæologia.

ANDREWS (Miles Peter), the son of an eminent merchant of London, coming into a considerable fortune by the death of an elder brother, devoted himself to writing for the stage. His dramas are Belphagor, a comic opera; Summer Amusements, ditto; Fire and Water, ditto; Best Bidder, a comedy; The Election, a musical interlude; The Mysteries of the Castle, a comedy; Dissipation, ditto; Baron of Kinkervankotsdarsprackengotchdern, ditto; Better Late than Never, ditto. Mr. Andrews in the late war was lieutenant-colonel of the St. Martin's volunteers; and maintained a splendid table, at which men of letters were ever welcome. His death, which was sudden, took place in 1814.

ANDREWS, ST. a royal borough of Fifeshire in Scotland, formerly the metropolis of the Pictish kingdom. It is seated in a bay, on the top of a small hill, thirty-nine miles from Edinburgh, commanding a view of the German Ocean. Lon. 2° 45′ W., lat. 56° 18′ N. If we may credit the legend, St. Andrews owes its origin to a singular accident. St. Regulus, or St. Rule, as he is likewise called, a Greek of Achaia, being warned by a vision to leave his native country, taking with him the relics of St. Andrew, and to visit Albion, he obeyed, and was shipwrecked on the coasts of Otholania, in the territories of Ungus, king of the Picts, A. D. 270. On hearing of the arrival of the strangers the king immediately gave orders for their reception, afterwards presenting the saint with his own palace, and building near it the church, which still bears the name of St. Regulus. St. Regulus is said to have established here the first Christian priests of the country, called Culdees. This church was supreme in the kingdom of the Picts; and the cross of St. Andrew became the badge of the country. In 518, after the conquest of the Picts, the episcopal see was removed to St. Andrews, and the bishop was styled 'maximus Scotorum episcopus.' In 1441 it was erected into an archbishopric by Sextus IV. at the intercession of James III. It contained the greatest part of the shire of Fife, with a part of Perth, Forfar, and Kincardine shires, and a great number of parishes, churches, and chapels in other dioceses. The town of St. Andrews was erected into a royal borough by David I. in the year 1140, and their privileges were afterwards confirmed. The charter of Malcolm II. written on parchment, is preserved in the tolbooth. Here also are kept the silver keys of the city, which for form's sake are delivered to the king if he should visit the place. The town underwent a siege in 1337; when possessed by

the English, and other firm partisans of Baliol; but the loyalists, under the earls of March and Fife, by the help of battering machines made themselves masters of it in three weeks.

The cathedral of St. Andrews was founded by bishop Arnold in 1161, but did not attain its full magnificence till 1318. Its length from east to west was 370 feet; that of the transept 322. But though this vast pile was 157 years in building, in June 1559 it was so effectually demolished in a day, that nothing now remains but part of the east and west ends, and of the south side. Near the east end is the chapel of St. Regulus; the tower of which is a lofty equilateral triangle, of 20 feet each side and 103 feet high; the body of the chapel remains. The priory was founded by Alexander I. in 1122; and the monks (canons regular of St. Augustine) were brought from Scone, in 1140, by Robert, bishop of this see. By an act of parliament in the time of James I. the prior had precedence of all abbots and priors, and on the days of festival wore a mitre and other episcopal ornaments. Dependant on this priory were those of Lochleven, Portmoak, Monimusk, the Isle of May, and Pittenweem, each originally a seat of the Culdees. The revenues of the house were £2237. 2*s*. 10½*d*. in money, and above 440 chaldrons of grain and meal: besides the produce of 480 acres of land. Nothing now remains of this splendid establishment except the walls of the precinct. The other religious houses were, one of Dominicans, founded in 1274 by bishop Wishart; another, of Observantines, founded by bishop Kennedy, and finished by his successor Patrick Graham in 1478; and the Carmelites, according to some writers, had a fourth. In the church of St. Salvator is a most beautiful tomb of bishop Kennedy, who died an honour to his family in 1466. Within this tomb were discovered, in 1683, six magnificent maces, which had been concealed in troublesome times. One was given to each of the other three Scotch universities, and three are preserved here. The parish church is a spacious structure, 162 feet in length by 63 in breadth, and capable of containing 2500 persons. Here is a lofty monument of white marble erected to the memory of archbishop Sharp, and representing in rude sculpture the tragical circumstances connected with it. St. Andrews also contains two places of worship for dissenters, and one for episcopalians.

The remains of the castle are still to be seen on the east side of the city, on a rock overlooking the sea. This fortress was founded in 1401 by bishop Trail, who was buried in the high altar of the cathedral; and was afterwards the residence of cardinal Beaton; who, after the death of the Protestant martyr, George Wishart, apprehending some danger, caused it to be fortified so strongly as to be at that time deemed impregnable. In this fortress, however, he was surprised and assassinated by Norman Lesly with fifteen others. They seized on the gate of the castle early in the morning of the 29th of May, 1546; it having been left open for the workmen who were finishing the fortifications; and having placed sentinels at the door of the cardinal's apartment, awakened his numerous domestics one by one. Then turning them out of the castle, they advanced without violence to the apartment of this prelate, and, in the language of Dr. Robertson, 'delivered their country, though by a most unjustifiable action, from an ambitious man, whose pride was insupportable to the nobles, as his cruelty and cunning were great checks to the reformation.' The conspirators were afterwards besieged in this castle by the regent, earl of Arran; and in 1547 it was reduced and demolished. The window was long shown from which the cardinal beheld the cruel martyrdom of Wishart, who was burnt on a spot beneath.

St. Andrews is a mile in circuit, and contains three principal streets. On entering the west port, a well-built street, straight, and of a vast length and breadth, appears; but presenting many traces of decayed magnificence. St. Andrews has, however, recently increased in the number of its inhabitants, who amount to near 5000. The trade, so late as the reign of Charles I., employed thirty or forty trading vessels, and was connected with a herring and white fishery, which had for ages been the source of considerable wealth. After the death of the king, this whole coast, and St. Andrews in particular, became a scene of plunder and rapine. At present the harbour, whose narrow entrance is guarded by piers, gives shelter to perhaps eleven or twelve vessels regularly employed in its trade; but it is much exposed to north-east winds. The game of golf is greatly practised in this neighbourhood; and there is a manufactory of golf-balls in the town, from which, after supplying the demand at home, 9000 are yearly sent to other places. Here is also a manufactory of sail-cloth, from which 16,000 yards have been sometimes yielded annually.

ANDREWS, ST. (University of). The celebrated university of this city was founded in 1411 by bishop Wardlaw; and the next year he obtained from Benedict III. the bull of confirmation. It consisted at one time of three colleges: 1. St. Salvator's, founded in 1458 by bishop Kennedy; this is a handsome building, with a court or quadrangle within; on one side of which is the church, on another the library. 2. St. Leonard's College, founded by prior Hepburn in 1522. This is now united with the last, and the buildings converted into private houses. 3. The New, or St. Mary's College, established by archbishop Hamilton in 1553; but the house was built by James and David Bethune, or Beaton, who did not live to complete it. The university is governed by a chancellor, an office originally designed to be perpetually vested in the archbishops of St. Andrews; but since the reformation he is elected by the two principals and the professors of both colleges. The rector is the next great officer, to whose care is committed the privileges, discipline, and statutes of the university. The colleges have their rectors, and professors of different sciences, who are indefatigable in their attention to the instruction of the students, and to that essential article, their morals. The classes and discipline of the two colleges are quite distinct; and each has its respective pro-

cipal and professors. But the library is common to both, and is entitled to a copy of every work entered in Stationers' Hall. Fifty-six bursanes, or endowments, are conferred on students belonging to this university, whose numbers have never exceeded 300: in 1816-17 they were 175.

ANDREWS, ST. a town and island in the bay of Passamaquoddy, North America, and part of the territory claimed by both the United States and Great Britain. If belonging to the latter it would be included in New Brunswick.

ANDRIA, a city and a bishop's see in the territory of Bari, in the kingdom of Naples. It is seated on a spacious plain, four miles from the Adriatic coast, and five west by south of *Trani*; giving the title to a duchy.

ANDRIA, in Grecian antiquity, called also *ανδρια*; public entertainments first instituted by Minos of Crete, and, after his example, appointed by Lycurgus at Sparta, at which a whole city or a tribe assisted. They were managed with great frugality, and considered as schools of temperance and sobriety, persons of all ages were admitted to them.

ANDRION, the hall or place of eating, where public entertainments were held in Crete, and in the uppermost part of which was a table set apart for strangers.

ANDRISCUS, a man of mean extraction, who pretending to be the son of Perseus, the last king of Macedonia, took the name of Philip, and was called Pseudo-Philippus. After a complete victory over Juventus, the Roman prætor, he assumed the kingly power, which he exercised with great cruelty. At last the Romans obliged him to fly into Thrace, where he was betrayed into the hands of Metellus, whose triumph he served to grace, walking in chains before him.

ANDROAS, or ANDRODAMAS, among ancient naturalists, a kind of pyritæ, to which they attributed certain magical virtues.

ANDROCLEA, daughter of Antipœnus of Thebes, who, with her sister Alcida, sacrificed herself in the service of her country; the oracle having promised a victory to the Thebans if any one of noble birth devoted himself for the glory of the nation. Antipœnus refused to do it, and his daughters cheerfully accepting it received great honours after death. Hercules dedicated to them the image of a lion in the temple of Diana. *Paus.* ix. c. 17.

ANDROCLUS, or ANDRODUS, a Dacian slave, who being exposed to a lion in the circus, the animal forbore to hurt him because he had formerly taken a thorn out of its foot. He was in consequence liberated, and led the lion about the streets of Rome. *Aul. Gell.* l. v. c. 14; *El. Hist. Anim.* l. vii. c. 48.

ANDROGEUS, in fabulous history, the son of Minos king of Crete, murdered by the youth of Athens and Megara, who envied his being always victor at the Attic games. Minos having taken these towns, obliged the inhabitants to send him an annual tribute of seven young men and as many young virgins, to be devoured by the Minotaur; from which tribute Theseus delivered them by killing the monster.

ANDROGYNA, in botany, plants bearing male and female flowers on the same root.

ANDROGYNES, in natural history, a name given to those human creatures who have appeared to unite in themselves the attributes of the two sexes. See HERMAPHRODITE.

ANDROGYNES, in the heathen mythology, were creatures of the above kind who had also two heads, four arms, and two feet! The rabbinical writers also pretend that Adam was created double, one body being male, the other female, which in their origin not being essentially joined, God afterwards did nothing but separate them. Plato adopts the same idea in his Banquet, and says the gods originally formed man with two bodies and two sexes; but that being also endowed with a gigantic force he became insolent and made war against the gods. Jupiter, exasperated, debilitated this double being by disjoining the male from the female, and leaving each half to subsist with its own powers alone. This fable of Plato has been used with great ingenuity by a modern French poet, who attributes the sexual passion to the natural ardour which each half of the androgynes feel for re-union; and the inconstancies of love to the difficulty which each of the separated parts encounters, in its effort to recover its proper and original half. If a woman appears to us amiable, we instantly imagine her to be that moiety with whom we should only have constituted one whole:

> The heart, with fond credulity impress'd
> Tells us the half is found, and hopes for rest;
> But 'tis our curse, that sad experience shows,
> We neither find our half, nor gain repose.

ANDROGYNUM BALNEUM, in antiquity, denotes a bath common to both sexes.

ANDROIDES; from *ανηρ*, a man, and *ειδος*, form; in mechanics, a human figure which by certain springs or other movements is made to perform some of the natural motions of a living man. The construction of an androides is justly supposed to indicate great skill in mechanics, and, with that of various other automata, has frequently engaged the attention of ingenious and curious minds. See AUTOMATON, under which we describe and classify all those various self-moving figures

ANDROLEPSY, in Grecian antiquity, an action allowed by the Athenians against such as protected persons guilty of murder. The relations of the deceased were empowered to seize three men in the city or house whither the malefactor had fled, till he was either surrendered or satisfaction made to them.

ANDROMACHE, the wife of the valiant Hector, the mother of Astyanax, and daughter of Aetion king of Thebes in Cilicia. After the death of Hector and the destruction of Troy, she married Pyrrhus; who afterwards gave her to Helenus the son of Priam, with part of Epirus.

ANDROMACHI THERIACA, or treacle of Andromachus, in pharmacy, an alexipharmic composition called also Venice treacle.

ANDROMACHUS, *Ανδρομαχος*, father of the historian Timæus, who founded the city of Tauremænium near Naxos, where he had assembled the Naxians who fled from the tyranny of

Dionysius. He also assisted Timoleon in rescuing Syracuse from the power of Dionysius in the 105th Olympiad, A. C. 360.

ANDROMEDA, in astronomy, a northern constellation behind Pegasus, Cassiopeia, and Perseus. It represents the figure of a woman chained. The stars in this constellation in Ptolemy's catalogue are twenty-three, in Tycho's twenty-two, in Bayer's twenty-seven, in Mr. Flamstead's no less than eighty-four.

ANDROMEDA, in botany, the marsh cystus: a genus of the monogynia order, belonging to the decandria class of plants, and in the natural method ranking under the eighteenth order, bicornes. The characters are: CAL. a quinquepartite perianthium, small, coloured, and persistent; COR. monopetalous, campanulated, and quinqufid, with reflected divisions; STAM. ten subulated filaments, shorter than the corolla; ANTH. two-horned and nodding; PIST. a roundish germen; a cylindric stylus larger than the stamina, and persistent, and an obtuse stigma: PER. a roundish five-cornered capsule, with five cells and five valves; SEEDS very numerous, roundish, and glossy. There are fifteen species, of which the following are the principal: 1. A. arborea, a native of Virginia and Carolina, where it is called the sorrel tree. 2. A. calyculata, a native of Siberia, and likewise of North America. 3. A. mariana, a native of North America, a low shrub sending out many woody stalks from the root. 4. A. paniculata, a native of Virginia and Carolina, growing in moist places. 5. A. polifolia, a low plant growing naturally in bogs in the northern countries.

ANDROMEDA, in mythology, the daughter of Cepheus and Cassiopeia, the wife of Perseus. Minerva translated her into the heavens.—This was also the name of a celebrated tragedy of Euripides, admired by the ancients above all the other compositions of that poet, but now lost.

ANDROMEDA, in entomology, a species of Papilio (Parnassus) found in India, according to Fabricius and Gmelin.

ANDROMEDA, in natural history, a species of Medusa amongst the vermes mollusca.

ANDROMEDA, in writers of the middle age, a kind of garment made of ram-skins.

ANDRON, in Grecian antiquity, denotes the apartment in houses designed for the use of men; in which sense it stands opposed to gynæceum, the female apartment. The Greeks also gave their dining-rooms the title of andron, because the men alone feasted there.

ANDRONA, in antiquity, a street, or public place, where people met and conversed together. In some writers androna is more expressly used for the space between two houses; and the Greeks use the term for the way or passage between two apartments.

ANDRONA, in ecclesiastical writers, that part in churches destined for the men. Anciently men and women had separate apartments in places of worship, where they performed their devotions asunder; which method is still religiously observed in the Greek church. The *ανδρων*, or androna, was on the southern side of the church, and the women's apartment on the northern.

ANDRONICUS I. Comnenus, emperor of the East, was the son of Isaac, and grandson of Alexis Comnenus. He was of an active martial mind, and eloquent; but had many vices. The emperor Manuel, who was his cousin, gave him a considerable command in Cilicia: but he was discovered in a treasonable correspondence with Germany and Hungary, and thrown into prison, where he continued twelve years. From this he escaped to Russia, and engaged the Russian prince to join his troops with those of Manuel in the invasion of Hungary. By this artifice he obtained a free pardon; but soon after incurred the imperial displeasure, which was increased by various intrigues till Manuel's death in 1165, and the accession of his son Alexis II. who being quite a youth, Andronicus was chosen partner in the government. The innocent Alexis soon fell a sacrifice to his coadjutor's thirst of power, having scarcely reigned two years, when the people, exasperated at his cruelties, proclaimed Isaac Angelus emperor, and having put Andronicus in irons, thrust out his eyes; he was now led through the city in derision, and at last stabbed in 1185 aged seventy-three.

ANDRONICUS, PALÆOLOGUS II., surnamed the Elder, succeeded Michael VIII. in 1283, and was driven in 1325 from the throne to a cloister by his grandson. He conceived such an aversion to his father for attempting to bring about an union of the Greek and Latin churches, that he would not suffer him to be interred.—*Gregor.* l. iv. &c.

ANDRONICUS, I. of Cyrrhus, an astronomer of Athens, constructed an octagon tower, with figures carved on each side, representing the eight principal winds. A brass triton at the summit, with a rod in its hand, turned with the wind, and pointed to the quarter whence it blew. From this circumstance the custom of placing weathercocks on steeples is supposed to be derived. Until very recently it served as a mosque for the Turks.

ANDRONICUS, of Rhodes, a peripatetic philosopher, who flourished B. C. 63, and to whom we are indebted for restoring and publishing the works of Aristotle in the time of Sylla. He also wrote commentaries on some of that philosopher's works.

ANDRONION, in physic, the name of a pastil, invented by an ancient physician named Andro. Its ingredients, according to Æginета's prescription, are the squamæ of copper, æs ustum, sal ammoniac, alumen rotundum, shavings of verdigrise, and frankincense, wrought up with wine.

ANDROPHAGI; from *ανηρ*, a man, and *φαγω*, I eat. See ANTHROPOPHAGI.

ANDROPOGON, or MAN'S-BEARD, in botany, a genus of plants of the monœcia order and polygamia class; in the natural method ranking under the fourth order, Gramina. The hermaphrodite calyx is a one-flowered bivalved glume: COR. a bivalved glume awned at the base: STAM. of three capillary filaments; antheræ oblong and bifurcated: PISTIL. an oval germen; with two capillary styli coalesced, and villous stigmata: no PERICARP.: SEED solitary, and covered. The male calyx, corolla, and stamina, the same with the hermaphrodite; but the

corolla without the awn. There are above eighteen species; of these the most remarkable is A. nardus, which produces the Indian nard, or spikenard of the shops. See SPIKENARD.

ANDROS, in ancient geography, an island between Tenedos and Eubœa; one mile distant from the former, and ten from the latter, and one of the ancient Cyclades. It had the various names of Cauros, Lasia, Nonagria, Epagris, Atandros, and Hydrusia. Here was formerly a city of great note, bearing the same name, and situated very advantageously on the brow of a hill. In this city, according to Strabo and Pliny, stood a temple dedicated to Bacchus, near which was a spring, called the Gift of Jupiter, the water of which had the taste of wine during the feasts of Bacchus. But if they were carried to a place whence the temple could not be seen, they lost their flavour. Pausanias says, that during the feast of Bacchus, wine flowed, or was at least by the Andrians *believed* to flow, from the temple of that god.

The Andrians were the first of all the islanders who joined the Persians at the time Xerxes invaded Greece: Themistocles, therefore, after the victory at Salamis, resolved to attack this city. Having landed his men on the island, he sent heralds to the magistrates, acquainting them that the Athenians were coming against them with two powerful divinities, Persuasion and Force; and therefore they must part with their money to one or other. The Andrians replied, that they likewise had two mighty deities who were very fond of their island, viz. Poverty and Impossibility; and therefore could give no money. Themistocles having laid siege to the town, probably made himself master of and destroyed it; as we are informed by Plutarch, that Pericles, a few years after, sent thither a colony of 250 Athenians. Being retaken by the Persians, on the overthrow of that empire by Alexander the Great, it submitted to him, and on his death sided with Antigonus, who was driven out by Ptolemy. We next read of it as besieged by Attalus, king of Pergamus, at the head of a Roman army; and on his death the republic claimed the whole island.

Andros is now subject to the Turks; and contains a town of the same name, with many villages, but most of the inhabitants are of the Greek communion. It is the most fruitful island in the Archipelago, and yields a great quantity of silk, wine, oil, and barley. There are said to be about 10,000 inhabitants. It is the appanage of a sultana, and the revenue is worth about 30,000 piastres.

ANDROS, or THE HOLY GHOST ISLANDS, (Isles del Espiritu Santo, as they were first called by the Spaniards,) a group of isles extending in the form of a crescent, for upwards of fifty leagues in the neighbourhood of the Great Bahama Bank, and amongst the Bahamas; in N. lat. 24° to 25° 30′, and W. long. 77° to 78° 20′. On the west side of these islands is the most northern extremity of the bank. The passages through them are dangerous to navigate; and northward they terminate in the line of the Berry Islands, which it is always preferable to go round in making Cuba from this quarter; the passage between them and the most northern of the Andros Isles having not above eight feet of water. On the east of these islands there is no soundings at any distance from the shore. The principal Andros island has its northern point between ten and eleven leagues W. N. W. and its most southern, called High Point, about eight leagues S. of the west end of New Providence. It contains a sort of swamp, in which the only fresh water of the Bahamas is found, and abounds with timber, which the danger of approaching in ships of burden has effectually protected from the axe. Attempts have nevertheless been made to colonize this island. In 1788, 200 inhabitants, including slaves, were settled here; and previous to May, 1803, lands were granted from the crown, to applications, amounting to 16,025 acres. It has the privilege of sending one member to the house of assembly of the Bahamas.

ANDROSACE, in botany, a genus of the monogynia order, and pentandria class of plants; ranking in the natural method under the twenty-first order, preciæ. The essential characters are: the male calyx is five-leaved: COR. is five-petalled: STAM. five, inserted on the rudiment of the stylus: the female calyx five-leaved; COR. wanting; the styli three: capsule trilocular: seeds two. Of this genus Linnæus reckons six species:— 1. A. carnea, growing naturally on the Helvetian mountains, the Alps, and in Siberia, but seldom more than three inches high. 2. A. elongata. 3. A. lactea, a native of the Alps, like the carnea, and of the same height. 4. A. maxima grows in Austria and Bohemia, among the corn. 5. A. septentrionalis. 6. A. villosa: these grow also on the Alps, in Siberia, and the mountains of Switzerland, and do not exceed three inches.

ANDROSÆMUM, in botany, St. John's wort.

ANDROUET (du Cerceau, J.), an architect of France, born at Orleans, or, as others state, at Paris, in the sixteenth century. He built the triumphal arch at Pola, in Italy, the gallery of the Louvre, and began the Pont Neuf at Paris. His writings are, 1. Livre d'Architecture, contenant les Plans et Dessins de Cinquante Batimens, &c. 2. Second Livre d'Architecture. 3. Les Edifices Romains, &c.

ANDRUM, in medicine, a kind of hydrocele, to which the people of Malabar are very subject.

ANDRYALA, downy sow-thistle, in botany, a genus of the polygamia æqualis order, and syngenesia class of plants; and, in the natural method, ranking under the forty-ninth order, compositæ-semiflosculus. The essential characters are: the receptacle is villous: CAL. many parted, subequal, and rounded; the pappus simple and sessile. The species are, 1. A. integrifolia, an annual, growing naturally in the south of France, Spain, and Italy. 2. A. lanata, a native of Sicily, and of the country round Montpelier. 3. A. ragusina, a native of the Cape of Good Hope. 4. A. sinuata grows in Spain and Portugal; the leaves broader, longer, and more downy, than either of the other sorts.

ANDUINNA, in entomology, a species of papilio (Nymph Phal.), found in Russia.

ANDUJAR, a city of Andalusia, in the province of Jaen in Spain. It is situated on the

southern declivity of the Sierra Morena, on the banks of the river Guadalquivir near the junction of the Jandula. Being protected by the Sierra from the north winds, and well irrigated, the country around it is highly productive in wheat, wine, oil, honey, and wax; and has some excellent pasture for cattle. From a white clay found near it some extensive manufactories of earthen ware are established, and especially those jars of a porous nature, which are highly esteemed in the hotter parts of Andalusia, from the property of cooling their liquors in the most intense heats. It was a Roman station, and the road constructed by those former masters of Spain passes through the city; where is a magnificent bridge, of modern erection, upon the foundations laid by the Romans. Its latitude is 38° 1′ 32″ north, and its longitude 4° 28′ 25″ west from London. The population is about 13,000 souls.

ANDUSE, a town of France in Languedoc, the head of a canton, in the department of the Gard, arrondissement of Alais. It is eight leagues and a half from Nismes, and eleven north of Montpelier, on the banks of the Gardon; and has a population of about 5000 persons, chiefly Protestants, employed in the manufacture of woollen stuffs, stockings, and hats.

ANEAR′. On, near.

The cardinal continues to pursue me; and to fright the clergy as much as he can from coming *anear* me.

Bp. Atterbury's Letters.

ANEAU (Bartholomew), a learned native of Bourges in France, in the sixteenth century. He was professor at Lyons, where he secretly supported the doctrines of the reformation for a long time; but on the festival of the Holy Sacrament in 1565, as the procession was passing towards the college, a large stone was thrown from one of the windows upon the host and the priest who carried it. The people, enraged at this, broke into the college, and assassinated Mr. Anau, whom they imagined to have been the occasion of this insult. His writings are, 1. Chant Natal, 4to. Lyons, 1539 and 1559; 2. Lyon Marchand, 4to. 1542; 3. Alciati's Emblems translated, 8vo. Lyons, 1549 and 1558; 4. Picta Poesis, 8vo. Ludg. Bat., 1552; 5. A translation of Sir Thomas More's Utopia, Paris and Lyons; 6 Alector, ou le Coq, Lyons, 1560.

AN′ECDOTE, *n.* } Ανεκδοτος; *a*, not; and
ANECDOT′ICAL. } εκδιδωμι, to publish. A piece of private history hitherto kept secret; an incident not generally known.

Some modern *anecdotes* aver,
He nodded in his elbow chair. *Prior.*

I allude to those papers in which I treat of the literature of the Greeks, carrying down my history in a chain of *anecdotes* from the earliest poets to the death of Menander. *Cumberland.*

They will also specify the few remaining *anecdotes* which occurred in a life so retired and sedentary as his. *Mason's Life of Gray.*

ANEE, in commerce, a measure for grain, used in some provinces of France. At Lyons it signifies also a certain quantity of wine, which is the load an ass can carry at once; and is fixed at about eighty quarts English wine-measure.

ANEGADA, one of the smaller Virgin Isles, east of Porto Rico. It is about eighteen miles in length, but unproductive and uninhabited, being generally under water in high tides. It is dependent on Virgin Gorda. Lat. 18° 46′ N., long. 64° 22′ N.

ANEGADIZOS, a river of South America, in the province of Choco, which runs directly from east to west into the Pacific Ocean, near the point of Salinas.

ANELE,′ } Ang. Sax. On elan. To oil
ANEILE, or } or rub with oil; to anoint; to
ANOYLE. } perform the rite of extreme unction, observed in the Catholic church.

Last of all cometh the *anoyling* wythout promise, and therefore without the spirite and without profiet, but altogether vnfruitful and superstitious.

The whole Workes of W. Tyndall, f. 153. c. i.

S. Gregory is also pretended in objection; for he gave dispensation to the priests of Sardinia, *ut baptizatos ungant,* to anneal baptized people.

Taylor's Episcopacy asserted.

ANELLA, in entomology, a species of phalæna, of the tinea tribe, inhabiting Austria; it is large, and has a ferruginous abdomen.

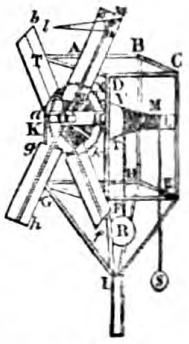
ANELLO. See MASSANIELLO.

ANEMIUS FURNUS, among chemists, a wind furnace; used to make fierce fires for melting, &c.

ANEMOCHENE, in music, is a name which has been given to the ÆOLIAN HARP, which see.

ANEMOMACHIA; from *ανεμος*, wind, and *μαχια*, fight; in some ancient writers, denotes a whirlwind, or hurricane.

ANEMOMETER; *ανεμος* and *μετρον*; an instrument contrived to measure the strength or velocity of the wind. Various instruments have been invented for measuring the velocity and power of the wind on a given surface, denominated generally anemometers or wind-gages. The first instrument of this description has been attributed to Wolfius, and was described by him in his Aerometry, in 1709, and afterwards in two or three other works of this author; but considerable improvements have since been made upon its construction. The one represented in the annexed diagram is the celebrated B. Martin's improvement on Wolfius's anemometer.—An open frame of wood, A B C D E F G H I, is supported by the shaft or arbor I. In the two cross-pieces H K, L M, is moved a horizontal axis Q M, by means of the four nails, *ah*, *cm*, *Of*, *gh*, exposed to the wind in a proper manner. Upon this axis is fixed a cone of wood, M N O; upon which, as the sails move round, a weight R, or S, is raised by a string round its superfices, proceeding from the smaller to the larger end N O. Upon this larger end or base of the cone is fixed a rocket-wheel *k*, in whose teeth the click X falls, to prevent any retrograde motion from the depending weight.—The structure of this machine sufficiently shows that it may be accommodated to estimate the variable force of the wind; because the force of the weight will continually increase as the string advances on the conical surface, by acting at a greater distance from the axis of motion; consequently,



if such a weight be added on the smaller part M, as will just keep the machine in equilibrio in the weakest wind, the weight to be raised as the wind becomes stronger will be increased in proportion, and the diameter of the cone, N O, may be so large in comparison to that of the smaller end at M, that the strongest wind shall but just raise the weight at the greater end.—If, for example, the diameter of the axis be to that of the base of the cone, N O, as one to twenty-eight; then, if S be a weight of one pound at M on the axis, it will be equivalent to twenty-eight pounds when raised to the greater end: if therefore, when the wind is weakest, it supports one pound of the axis, it must be twenty-eight times as strong to raise the weight to the base of the cone. If therefore a line of scale of twenty-eight equal parts be drawn on the side of the cone, the strength of the wind will be indicated by that number on which the string rests.

One of the most ingenious and convenient methods for measuring the force of the wind is to employ its pressure in supporting a column of water: an instrument of this kind was, we believe, first proposed by Dr. Lind, and is described by him in the Phil. Trans, vol. lxxv., a brief account of which is as follows: A B, C D, in fig. 60, PNEUMATICS, are two glass tubes, which should not be less than eight or nine inches long, the bore of each being about ·4 of an inch in diameter; they are connected together by a small bent glass tube, *a b*, only one-tenth of an inch in diameter, to check the undulations of the water, caused by a sudden gust of wind. On the upper end of the leg A B is fitted a thin metal tube, having its end open to receive the wind blowing horizontally into it. The two tubes, or rather the two branches of the tube, are connected to a steel spindle, K L, by slips of brass near the top and bottom, by the sockets of which, at *e* and *f*, the whole instrument turns easily about the spindle, which is fixed into a block by a screw in its bottom, by the wind blowing into the orifice at F. When the instrument is used, a quantity of water is poured in till the tubes are about half full; then exposing the instrument to the wind, this, by blowing in at the orifice F, forces the water down lower in the tube A B, and raises it so much higher in the other tube; and the difference between the heights of the surfaces of the water in the two tubes, estimated by a scale of inches and parts, H I, placed by the side of them, will be the height of a column of water, whose pressure is equal to the force or momentum of the wind, blowing or striking against an equal base. Now, as a cubic foot of water weighs 1000 ounces, or 62½ pounds, the twelfth part of which is 5⅛ lbs. nearly; therefore, for every inch the surface of the water is raised, the force of the wind will be equal to so many times 5⅛ lbs. on a square foot. Thus, suppose the water to stand 3 inches higher in one tube than in the other, then $3 \times 5\frac{1}{3} = 15\frac{3}{4}$ lbs. will be equal to the pressure or force of the wind on the surface of a square foot.

This instrument of Dr. Lind's, it may be said, measures only the force or momentum of the wind, but not its velocity. The velocity of the wind, however, may be deduced from its force so obtained, by help of some experiments performed by Dr. Hutton at the Royal Military Academy, in the years 1786, 1787, and 1788; from which it appears that a plane surface of a square foot suffers a resistance of twelve ounces from the wind, when blowing with a velocity of twenty feet per second; and that the force is nearly as the square of the velocity. Hence then, taking the force of 15¾ pounds, above found, for the force of the wind when it sustains three inches of water, and taking the square roots of the forces, it will be as $\sqrt{\frac{3}{4}} : \sqrt{15\frac{3}{4}} :: 20 : 91\frac{1}{3}$ the fourth proportional, that is, a velocity of 91⅓ feet per second, or 62 miles per hour, is the rate or velocity at which the wind blows, when it raises the water three inches higher in the one tube than the other. And farther, as the said height is as the force, and the force as the square of the velocity, we shall have the force and velocity corresponding to several heights of the water in the one tube above that in the other, as in the following table:—

TABLE of the corresponding height of Water, Force on a square foot, and velocity of Wind.

Height of Water.	Force of Wind.	Velocity of Wind per hour.
Inches.	Pounds.	Miles.
0¼	1.3	18.0
0½	2.6	25.6
1	5.2	36.0
2	10.4	50.8
3	15.6	62.0
4	20.8	76.0
5	26.0	80.4
6	31.25	88.0
7	36.5	95.2
8	41.7	101.6
9	46.9	108.0
10	52.1	113.6
11	57.3	119.2
12	62.5	124.0

In one instance Dr. Lind found that the force of the wind was such as to be equal 34$\frac{8}{10}$ pounds, on a square foot; and this by proportion, in the foregoing table, will be found to answer to a velocity of 93 miles per hour!

ANEMONE, WIND-FLOWER, in botany, a genus of the polygamia order, and polyandria class of plants; ranking in the natural method under the twenty-sixth order, multisiliquæ. It has its name from the Greek *ανεμος*, signifying the wind because the flower is supposed not to open unless the wind blows. The characters are: no CAL.: COR. petals of two or three orders, three in each series, oblong: STAM. numerous capillary filaments; the antheræ didymous and erect: PIST. numerous germina collected into a head; the styli pointed; the stigmata obtuse: no PERICARP. the receptaculum is globular: the seeds are very numerous. Of this genus Linnæus enumerates twenty-one species; those valuable on account of the beauty of their flowers are the following: 1. A. appennina, a native of

Britain, growing in woods. 2. A. coronaria; 3. A. hortensis, natives of the Levant, particularly of the Archipelago islands, where the borders of the fields are covered with them. 3. A. nemorosa, growing wild in the woods in many parts of Britain, where it flowers in April and May. This genus has received much improvement and illustration from the pen of professor de Candole (De Cand. Syst. v. i. 188.) who enumerates forty-five species.

ANEMONE, SEA. See ANIMAL FLOWER

ANE'MONY. Gr. *ανεμονη*, the wind-flower, from *ανεμος*, the wind; because says Minshew, when the wind blows the flower opens.

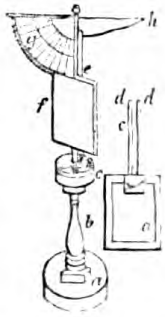
Upon the top of its single stalk, surrounded by a leaf, is produced one naked flower, of many petals, with many stamina in the centre; the seeds are collected into an oblong head, and surrounded with a copious down. The principal colours in *anemonies* are white, red, blue, and purple, sometimes curiously intermixed. *Miller.*

Wind flowers are distinguished into those with broad and hard leaves, and those with narrow and soft ones. The broad-leaved *anemony* roots should be planted about the end of September. Those with small leaves must not be put into the ground till the end of October. *Mortimer.*

From the soft wing of vernal breezes shed,
Anemonies, auriculas, enrich'd
With shining meal o'er all their velvet leaves.
Thomson.

See yonder *anemonies* their leaves unfold,
With rubies flaming and with living gold;
While crystal showers from weeping clouds descend,
Enjoy the presence of thy tuneful friend.
Sir W. Jones's Turkish Ode of Mesihi

ANEMOSCOPE, (from *ανεμος* and *σκοπος*,) a machine invented to foretel the changes of the wind or weather, and sometimes showing by an index what the present direction of the wind is. Of this latter sort, it seems, was that used by the ancients, and described by Vitruvius; and we have many of them at present in large or public buildings, where an index withinside a room or hall points to the name of the quarter from whence the wind blows without; which is simply effected by connecting an index to the lower end of the spindle of a weather-cock. The term has likewise been used to denote what is now commonly called an hygrometer. We add a description of one contrived by the late Mr. Pickering, and published in the Philosophical Transactions, No. 473. This anemoscope is a machine four feet and a quarter high, consisting of a broad and weighty pedestal, a pillar fastened into it, and an iron axis of about half an inch diameter fastened into the pillar. Upon this axis turns a wooden tube; at the top of which is placed a vane of the same materials, twenty-one inches long, consisting of a quadrant, graduated and shod with an iron rim, notched to each degree; and a counterpoise of wood, as in the figure, on the other. Through the centre of the quadrant runs an iron pin, upon which are fastened two small round pieces of wood, which serve as moveable radii to describe the degrees upon the quadrant, and as handles to a velum or sail, whose plane is one foot square, made of canvas, stretched upon four battens and painted. On the upper batten, next to the shod rim of the quadrant, is a small spring which catches at every notch corresponding to each degree, as the wind shall, by pressing against the sail, raise it up; and prevents the falling back of the sail, upon lessening of the force of the wind. At the bottom of the wooden tube is an iron index, which moves round a circular piece of wood fastened to the top of the pillar on the pedestal, on which are described the thirty-two points of the compass. The figure is given in the annexed diagram: where *a* is the pedestal, *b* the pillar on which the iron axis is fitted, *c* the circle of wood on which are described the thirty-two points of the compass, *e* the wooden tube upon its axis, *f* the velum, *g* the graduated quadrant, *h* the counterpoise of the vane of the velum, which takes off; *a* is the plane, *b* the spring, *c* the wooden radii, *d d* the holes through which the pin in the centre of the quadrant goes. The inventor of this machine tells us, that he carefully examined what dependence may be had upon it during several severe storms, and found that it answered exceedingly well; for that in such winds as the sailors call violent storms, the machine had six degrees to spare for a more violent gust before it comes to a horizontal position.



ANEMUR, CAPE, the southern extremity of Caramania, opposite the Isle of Cyprus; on the promontory are the ruins of the ancient city Anemuriam: N. lat. 36° 15′, E. long. 32° 36′.

ANEMURIUM, in ancient geography, *Ανεμουριον*, now Scalemura, a town and promontory of Cilicia, which struck medals of Domitian, Domitia Longina, Caracalla, Alexander Severus, &c. with the addition sometimes of the name of their prætors, as on a medal of Severus. CT. ANTON. ANEMOYPIEΩN, i. e. *Prætore Antonio Anemuriensium*; the types are mostly a turreted head, or a figure of Diana Alphæa, or of Bacchus.

ANEN', *prep.* } ANENST', } ANENT', } ANEN'TIS, } ANEYN'TIS. } No satisfactory etymology has been given of these words, nor is their signification accurately defined. *Anentis*, in Wicklif's New Testament, is equivalent to *with*. With regard to; on the part of; answering to the Latin *apud*.

Anenst, says archdeacon Nares in his Glossary, is a Chaucerian word, signifying against.

And Jhesus biheld hem and seyde *anentis* men it is impossible, but not *anentis* God; for alle thingis ben possible *anentis* God. *Wicklif. Mark* x.

Therfor *anenst* their estatis I wol in no manere Deme ne determyn. *Chaucer. Pardoncre and Tapstere.*

AN-END, in marine affairs, as applied to a mast or beam, expresses its perpendicular situation: thus the topmast is AN-END, when hoisted to its usual situation at the head of the lower mast.

ANETHINUM VINUM aut OLEUM, in medicine, *ανηθινος οινος*, a preparation of wine or oil with anethum.

ANETHOXULA, in botany, the woody part of dill.

ANET, a town of France in the department of the Eure and Loire, arrondissement of Dreux, and the chief place of a canton. It has 240 houses, and 1570 inhabitants, with a beautiful castle, erected by Henry IV. for his favourite, the duchess of Valentinois. It was stripped of its most valuable ornaments in the course of the revolution. In the neighbourhood is a large iron forge. Anet is three leagues north of Dreux, and ten north of Char tres.

ANETHUM, Dill and Fennel, in botany, a genus of the digynia order, and pentandria class of plants; ranking in the natural method under the forty-fifth order umbellatæ. The essential characters are: the fruit oval, compressed, striated; petals five, involute, entire, and very short. 1. A. feniculum, or fennel, of which there are two varieties, the common and the sweet. 2. A. graveolens, or dill, an annual plant; the root long, slender, and white; the leaves are divided into a multitude of fine, long, narrow segments, like those of fennel, but of a bluish green colour, and less strong smell. Of the first species, the fennel, both the seeds and roots are used in medicine. The seeds of both the fennels have an aromatic smell, and a moderately warm pungent taste: those of the sweet fennel are in flavour most agreeable, and have also a considerable degree of sweetness; hence our colleges have directed the use of these only. They are ranked among the four greater hot seeds, and not undeservedly looked upon as good carminatives.

ANEURIN, a celebrated British poet, called the sovereign of bards and of flowing music, who flourished about the beginning of the sixth century. He was a chieftain among the Otodinian Britons, who behaved valiantly at the battle of Cattraeth, which he celebrates in a poem preserved in the Welsh archæology. This, with another piece entitled the Odes of the Months, is all that now remains of his works. He died about A. D. 570.

ANEURISM, *ανευρυνω*, a disease of the arteries, in which they become excessively dilated, or by a wound through their coats the blood is extravasated among the adjacent cavities. It may be more accurately defined a throbbing tumour, distended with blood, and formed by a dilatation or rupture of an artery. See Surgery, *Index*.

ANEW'. Of new. See New.

In vain therefore dost thou now take in hand
To call, to count, or weigh, his works *anew*;
Whose counsel's depth thou canst not understand;
Since of things subject to thy daily view
Thou dost not know the causes nor the courses due.
Spenser.

Nor, if at mischief taken, on the ground
Be slain, but pris'ners to the pillars bound,
At either barrier plac'd; nor, captives made,
Be freed, or, arm'd *anew*, the fight invade. *Dryden.*

That, as in birth, in beauty you excel,
The muse might dictate, and the poet tell:
Your art no other art can speak; and you,
To show how well you play, must play *anew*. *Prior.*

The miseries of the civil war did, for many years, deter the inhabitants of our island from the thoughts of engaging *a ew* in such desperate undertakings.
Addison.

He who begins late is obliged to form *anew* the whole disposition of his soul, to acquire new habits of life, to practise duties to which he is utterly a stranger.
Rogers

ANEWST', or Aneust. } Nian, Ang.-Sax. near, is proposed by Skinner. Sax. nebert, neighbourhood. Used in the dialect of the western counties, as *aneust* the matter; suitably; in a becoming manner; approaching to perfection.

ANFELDTHYDE, or Anfealthile, in the old Saxon law, a simple accusation; for the Saxons had two sorts of accusation, viz. *simplex* and *triplex*. That was called single when the oath of the criminal and of two more was sufficient to discharge him; but his own oath, and the oaths of five more, were required to free him *à triplice accusatione*.

ANFILOCHA, a town of ancient Epirus, now Jeroirlia. It was almost ruined during the wars between the Venetians and Turks.

ANFOSSI (P.), a musical composer of eminence in the last century, a pupil of Sacchini and Piccini. After composing several operas which met with great success at Rome, his L'Olympiade encountered a most unfavourable reception. Anfossi in consequence visited Paris in 1780, where his Caius Marius was performed, and afterwards London. He died at Rome in 1795. L'Avaro is considered his *chef d'œuvre*.

ANFRAC'TUOSE, *ad.* Anfrac'tuous, Anfrac'tuousness. } Lat. *anfractus*, or *amfractus*, from am, the inseparable preposition (Gr. *αμφι*) around, and *frango*, *fractum*, to break. Applied to the interruption of a circuitous course by frequent breaks, indentations, or chasms. The turning, bending, or winding of a way in and out. *Anfractus Judiciorum*, Cicero, the cunning tricks or windings of chicanery.

Behind the drum are several vaults and *anfractuose* cavities in the ear-bone, so to intend the least sound imaginable, that the sense might be affected with it; as we see in subterraneous caves and vaults, how the sound is redoubled. *Ray.*

ANGAD, a desert track, eighty-four miles in length and fifty-four in breadth, the eastern extremity of the territory of Algiers, which it separates from that of Morocco. It contains numerous springs, and supports a considerable and war-like population.

ANGALA-DIAN, in natural history, a name given by Buffon to the certhia lotenia of Gmelin.

ANGAR, Angan, or Hindsham, an island in the Persian Gulf south of Kishma, about twelve miles in circuit. It is covered with pits of salt and metalic ores, but is barren and uninhabited.

ANGARA, a river of Siberia, which rises in the lake Baikal, and after passing Irkutsk with a rapid course receives the Oka; and changing its name to Toungooska falls into the Enissey, or Yenesei: it is navigable to Yeneseisk. Also a town of Thibet, 20 miles N.N.W. of Dharmsaleh.

ANGARAES, a province of Peru, bounded on the north by Jauja, or Xauxa, on the west by the Andes, and on the east by the province of Huanta. It is seventy-two miles in length from

east to west, and twelve in width, being of an irregular figure. It abounds in wheat and other grain, and is watered by some of the head streams of the Apurimac, which runs into the Amazons, and by this river has an easy communication with the Atlantic. The sugar-cane, and some fruits and herbs, are found in the temperate parts, and a kind of hay, which serves as fuel for the ovens in which they extract the quicksilver. The province also abounds in cattle of every kind, and produces a great variety of coloured earths for painting, such as amber, vermilion, &c. Guancavelica is the chief town.

ANGARI, or ANGARII, in antiquity, public couriers appointed for the carrying of messages. The ancient Persians, Budæus observes, had their *αγγαρειον δρομημα*, a set of couriers on horseback, posted at certain stages, always in readiness to receive the despatches from one and forward them to another with celerity, answering to what the modern call posts, q. d. positi, as being at certain places or stages. The angari were also called by the Persians astandæ; by the Greeks, *ημεροδρομοι*, on account of the long journeys they made in one day, which, according to Suidas, amounted to no less than 1500 stadia.

ANGARIA, in Roman antiquity, was a kind of public service imposed on the provincials, which consisted in providing horses and carriages for the conveyance of military stores and other public burdens. It is sometimes also used for a guard of soldiers posted for the defence of a place; and, in a more general sense, for any kind of service performed through compulsion.

ANGARIATION, Angario, Gr. *αγγαρευειν*, from *αγγαρος*, one compelled to go. Compelled obedience to authority, generally usurped and unlawful.

But if, in these earthly *angariations*, one mile, according to our Saviour's counsel, may bring on another; yet, in spiritual evil ways, no compulsion can prevail upon a resolved spirit.

Bp. Hall's Temptations Repelled.

ANGE DE ST. ROSALIE, an Augustine monk, was born at Blois in 1655, and died in 1726. He wrote the History of the House of France, and of the Great Offices of the Crown, which was published after his death in nine volumes folio. He was likewise the author of the State of France in five volumes 12mo.

ANGEDIVA, a small island in the Indian Ocean, off the coast of Malabar, belonging to the Portuguese. It is 60 miles S.S.E. of Goa. Long. 74° 12′ E., lat. 14° 43′ N.

ANGEIOLOGY, in anatomy, the description of the vessels in a human body; e.g. the nerves, veins, and lymphatics. See ANATOMY, Index.

ANGEIOTOMY, in surgery, implies the opening a vein or artery, as in bleeding; and consequently includes both arteriotomy and phlebotomy.

AN'GEL, *n.* & *adj.*, ANGEL'ICAL, ANGEL'IC, AN'GLIFIE, ARCH'ANGEL. *Αγγελος*, one sent to deliver a message; from *αγγελω*. Particularly applied to the messengers of God. Ang.-Sax. Godes ærend-gast; God's errand ghost. Sometimes used of fallen spirits. In an acquired sense, whatever is transcendently beautiful or lovely.

Als alle pis sorow and wo was in pe gynnyng;
Died S. Dunstan, men herd pe *angels* syng.
R. Brunne, p. 38.

Some holy *angel*
Fly to the court of England, and unfold
His message ere he come. *Shakspeare.*

I have mark'd
A thousand blushing apparitions
Start into her face; a thousand innocent shames
In *angel* whiteness bear away those blushes. *Id.*

Or virgins visited by *angel* powers,
With golden crowns, and wreaths of heav'nly flow'rs.
Pope's Rape of the Lock.

It discovereth unto us the glorious works of God, and carrieth up, with an *angelical* swiftness, our eyes, that our mind, being informed of his visible marvels, may continually travel upward. *Raleigh.*

Others more mild,
Retreated in a silent valley, sing
With notes *angelical* to many a harp
Their own heroic deeds, and hapless fall
By doom of battle. *Milton.*

My fancy form'd thee of *angelic* kind,
Some emanation of th' all-beauteous mind. *Pope.*

It may be encouragement to consider the pleasure of speculations, which do ravish and sublime the thoughts with more clear *angelical* contentments.

Wilkins's Dædalus.

Had we such a knowledge of the constitution of man, as it is possible *angels* have, and it is certain his Maker has, we should have a quite other idea of his essence. *Locke.*

Talents *angel* bright,
If wanting worth, are shining instruments
In false Ambition's hand to finish faults
Illustrious, and give infamy renown. *Young.*

ANGEL, Αγγελος Gr., מלאך Heb. messenger, 'Nomen non naturæ sed officii,' a name not of nature but of office, and applied to men acting officially with respect to each other; 2 Sam. ii. 5. Luke vii. 24. 2. To human messengers acting under a divine commission; Matt. xi. 10. Haggai i. 13. 3. To officers and representatives of the Christian church; Rev. i. 20. ii. 1. 4. To inanimate creatures and inferior agents of the Almighty's power; Psal. civ. 4. 5. To a higher order of spiritual and intelligent creatures, of whose nature and employments we have but a very imperfect knowledge; Psal. xc. 1—11. ciii. 20. Heb. ii. 7., and other parts of the sacred scriptures. 6. To the Messiah the sent of God, who is often distinguished by The Angel of the Lord, The Angel of the Covenant, &c. Some imagine that the same person is intended with the word archangel, there being only one archangel mentioned in Scripture.

The popular application of the term is, to the spiritual and intelligent beings to which we have already referred, and who are considered to occupy the first rank of creatures, though they have generally assumed a human form.

The angels are in Daniel, iv. 13, &c. called ישים, or watchers, from their vigilance: for the same reason they are in the remains we have of the prophecy attributed to Enoch, named Egregori; which imports the same in Greek. The apostle calls them 'ministering spirits,' and from their being set in opposition to the nature of man, in Heb. ii. 16., we conclude them capable of the highest employments and happiness, &c.

The existence of angels is incapable of being proved, à priori; but has, nevertheless, in all religions maintained an universal prominence. The ancient Sadducees denied the existence of all spirits, and yet the Samaritans and Caraites, reputed of that class, openly allow them, as appears from Abusaid's Arabic version of the Pentateuch, and a comment upon the Pentateuch by Aaron a Caraite Jew, both extant in manuscript in the library of the king of France. In the Alcoran we find frequent mention of angels, which in the faith of the Mussulmen are of different orders, and destined to different employments, both in heaven and in earth. They attribute to the angel Gabriel the power of descending from heaven to earth in the space of an hour, and of overturning a mountain with a single feather of his wing. Esrafil, they describe as standing with a trumpet in his mouth ready to proclaim the day of judgment. The highest order of this heavenly hierarchy is named Azazil, to which Satan, so called in the Alcoran, (as also Eblis or perdition,) is said to have originally belonged; and also the Gabriel and Michael of holy writ. Here too are placed Azrael, the angel of death or destiny, to whom is committed the care of departed souls; and Esrafil the angel of the resurrection, mentioned above. Subordinate are Monker and Nakir, whose office it is to enquire into the true condition of departed souls on their decease. To every man on earth two guardian angels are assigned. Jin, or genii, are a lower race, formed of grosser fire than the superior orders; they are subject to the passions and appetites of man, propagate their species, and according to the modern theology of the Arabians are subject to death.

The heathen philosophers generally agreed with regard to the existence of those intelligences, as is shown by St. Cyprian in his treatise of the vanity of idols, from the concurrent testimonies of Plato, Socrates, Trismegistus, and others; Epicurus being the only philosopher who is said absolutely, to have rejected them. In the earliest fragments of the poetry of Greece, we find allusions to the agency of these distinguished beings. Hesiod furnishes no incorrect description of their powers and office; Op. et Dies, i. 246.

—— Ἐγγὺς γὰρ ἐν ἀνθρώποισιν ἰόντες
Ἀθάνατοι λεύσσουσιν, ὅσοι σκολιῇσι δίκῃσι
Ἀλλήλους τρίβουσι, θεῶν ὄπιν οὐκ ἀλέγοντες.
Τρὶς γὰρ μύριοί εἰσιν ἐπὶ χθονὶ πουλυβοτείρῃ
Ἀθάνατοι Ζηνὸς, φύλακες θνητῶν ἀνθρώπων,
Οἵ ῥα φυλάσσουσίν τε δίκας καὶ σχέτλια ἔργα,
Ἠέρα ἑσσάμενοι, πάντῃ φοιτῶντες ἐπ' αἶαν.

Thus given by Cooke,

—— a world of holy dæmons made,
Aerial spirits, by great Jove designed
To be on earth the guardians of mankind;
Invisible to mortal eyes they go,
And mark our actions, good or bad, below;
Th' immortal spies, with watchful care preside,
And thrice ten thousand round their charges glide,
They can reward with glory, or with gold;
A power they by divine permission hold.

Spirits, or dæmons, were believed by the Greeks to hold a middle rank between the gods and mankind, Παν το δαιμονιον μεταξυ εστι θεου τε και θνητου, Plato in Symp.; and Plutarch says, 'those seem to me to have solved very many and great difficulties, or doubts, who place the dæmons εν μεσῳ θεων και ανθρωπων.' De Defect. Orat. The word dæmon was generally used in a good sense; great and wise men were reported to hold familiar intercourse with the tutelary agents of the gods. The tutelary genius of Socrates, of Numa, and of Augustus, are well known in history. Sometimes the terms dæmon and genius appear to have been used by the Greeks and Romans in an evil sense; 'Juxta usurpatam penes Græcos loquendi consuetudinem tam sancti sunt dæmones quam profesti et infidi,' says Calcidius. Thus we find the evil genius of Brutus appearing before him the night before the battle of Philippi.

The ancient Persians, according to Mr. Sale, were so learned in the ministry of angels in this lower world, that they assigned them distinct charges and provinces, giving their names to the months and days of the months. Thus, as Michael was considered the prince of the Jews, Raphael became the prince of the Persians. Hyde, Reb. Vel. Pers. c. 19. 20. The Jews after their return from the captivity in Babylon, infected by the wisdom of the Chaldean sages, who peopled the air with agencies of this description, began to find numerous names and distinct orders of angels; of which, four principal ones are reckoned. That of Michael, the first in order; Gabriel the second; Uriel the third; and Raphael, the fourth. In the apocryphal book of Tobit the last is made to say, 'I am Raphael, one of the seven holy angels which present the prayers of the saints, and which go in and out before the glory of the Holy One.' Ben Maimon, and other writers, speak of ten degrees, or orders of angels, anciently acknowledged by the Jews. Calmet, Dict. Bib., affirms, that the Jews did not know the name of any angel before the Babylonish captivity, there being none mentioned in the books written before that event.

From these various sources, the Christian fathers received and adopted many strange notions on this subject. Some of them imagined that angels had bodies; of which opinion were Clemens Alexandrinus, Origen, Cæsarius, and Tertullian. Others regarded them as pure spirits, who could assume bodies at pleasure; amongst whom were St. Athanasius, Basil, Gregory Nicene, Cyril, and St. Chrysostom. Very common amongst them was the heathen notion of a race of beings, who were born either from the love of gods or angels for women; or the love of men for goddesses. This they thought to be the meaning of Gen. vi. 2. which, according to some copies of the Septuagint, is said to read 'angels of God.' Ecclesiastical writers in the middle ages, divided these intelligences into nine orders, constituting three hierarchies. The first including cherubim, seraphim, and thrones; the second, dominions, virtues, and powers; and the third, principalities, angels, and archangels. Hence Milton, in his inimitable use of angels, as instruments in the machinery of his 'Paradise Lost,' has the following passage;

'Hear all ye angels, progeny of light;
Thrones, dominations, princedoms, virtues, powers,
Hear my decree.'

Similar distinctions have been thought to be sustained by the language of inspiration in such passages as Ephes. i. 21; Col. i. 16, &c. Bishop Horsley, in one of the latest of his sermons, has a passage upon this subject, which we cannot forbear extracting, as an able summary of numerous opinions upon this point. It is from Dan. iv. 17. 'This interpretation of these words (that the watchers and Holy Ones are principal angels) is founded upon a notion which got ground in the Christian church many ages since, and unfortunately is not yet exploded; namely, that God's government of this lower world is carried on by the administration of the holy angels; that the different orders (and those who broached this doctrine could tell us exactly how many orders there are, and how many angels in each order), have their different departments in government assigned to them; some, constantly attending in the presence of God, form his cabinet council; others are his provincial governors; every kingdom in the world having its appointed guardian angel, to whose management it is entrusted; others, again, are supposed to have the charge and custody of individuals. This system is, in truth, nothing better than the pagan polytheism somewhat disguised and qualified; for, in the pagan system, every nation had its tutelar deity, all subordinate to Jupiter, the sire of gods and men. Some of those prodigies of ignorance and folly, the Rabbin of the Jews, who lived since the dispersion of the nation, thought all would be well, if for tutular deities they substituted tutelar angels. From this substitution, the system which I have described arose: and from the Jews, the Christians, with other fooleries, adopted it.'

Authors are divided as to the time of the creation of angels; some will have it to have been before the creation of our world, or even before all ages, that is, from eternity; this is Origen's opinion, who, according to Leontius, held that all spirits, angels, devils, and even human souls, were from eternity. Others hold angels to have been created before the world, yet not from eternity. Others, again, maintain that they were created at the same time with our world, but on what day is disputed. Theodoret and Ephiphanius fix their date from the first day.

The concluding sentence of the narrative of the creation, 'Thus the heavens and the earth were finished, and all the host of them,' would certainly seem to include them among the works of the six days. It is peculiar to Jehovah to have been able to say, 'Before the day was, I am He.'

Their qualifications are to be inferred from the facts recorded of them, as ascending in fire, passing through prisons, the doors flying open at their presence, shutting the mouths of lions, smiting tens of thousands of men in a night, and other notable instances of power over nature recorded in the sacred scriptures.

Their number is vast as appears from many parts of the Old and New Testaments, and especially from the term 'hosts of heaven.' The prophet Daniel represents them as a thousand thousand, and ten thousand times ten thousand; intended no doubt to express an indefinite number, in which the imagination is lost. Of the few facts of their history it appears, that at their creation the angels were perfect and lived in heaven, but numbers of them afterwards sinned and were banished to hell. The nature of their crime though nowhere stated, is thought capable of being inferred from 1 Tim. iii. v. 6.; and as they are reserved for future judgment, the facts of their case may be in analogy to ours. Fallen angels appear to be of different orders, subject to one chieftain more powerful and wicked than the rest, distinguished by the epithet שטן Satan, διαβολος, a traducer, an accuser, the prince of the power of the air, the God of the world, and the like expressions. He is said to have instigated their rebellion, to have tempted our first parents, to persecute the church, and on account of his subtlety is called the Old Serpent.

The employment of angels is various, depending perhaps upon their different ranks and degrees of capacity. The case of individual preservation and of the persecution of the church; the plagues of Egypt, the destruction of Sodom, the delivery of the law, the different appearances of angels during the old dispensation, and other important inferences recorded of them, illustrate this remark; but doubtless, a noble portion of angelic employment, is that of unceasing adoration and praise. Their power to suspend the laws of nature, and the astonishing command they assume over the material elements, render it highly probable that they will, according to some intimations of Scripture, be employed in the closing scenes of time—to raise the dead, to attend the last judgment, to purify the universe, to assist in reforming that fresh and glorious system which St. Peter saw stretched along the perspective of prophecy.

Dr. Pye Smith of Homerton, in his excellent work on the power of Christ, has devoted a section of chapter iv. vol. 1. to an enquiry respecting 'who was the person denominated the Angel of Jehovah' with certain remarkable attributes and ascriptions in the Old and New Testament. He recites Gen. xvi. 7—13. xxii. 11—18. xxxi. 11—13. xlviii. 15 16. Exod. iii. 2. 15. xxiii. 20, 21. Ps. xxxiv. 7. Is. lxiii. 8, 9. Zech. iii. 1—4. xii. 9. and Mal. iii. 1., as the most remarkable passages, and thus brings together the principal features of his character as contained in them: 'The person described claims an uncontrolled sovereignty over the affairs of men. He has the attribute of omniscience and omnipresence. He uses the awful formula by which the Deity on various occasions condescended to confirm the faith of those to whom the primitive revelations were given; He sweareth BY HIMSELF: He is the gracious Protector, the Redeemer from evil, and the Author of the most desirable blessings: His favour is to be sought with the deepest solicitude, as an enjoyment of the highest importance to the interests of men: He is the object of religious invocation: He is in the most express manner, and repeatedly declared to be JEHOVAH, GOD, the ineffable I AM THAT I AM! Yet this mysterious Being is represented as distinct from God, and acting (as the term angel imports) under a divine mission.

'Are there then,' asks the learned author, 'two Jehovahs?—Revelation and enlightened reason

reject the notion. Three other modes of solution have been proposed: 1. That the angel of the divine presence was some eminent, celestial, creature, sent to convey the messages of the divine will to those who were the immediate subjects of revelation; acting therefore, on behalf of the Deity; and allowed to *personate* the Deity in the assumption of the attributes and forms of address which are distinctive of him. To this he offers various objections. 2. That the expression is nothing but an Hebraism to denote God himself, or some miraculous token of the divine presence. This is Dr. Priestley's, and Mr. Belsham's, opinion. The phrase 'angel of Jehovah,' means either the visible symbol of the divine presence, or Jehovah himself.' But this decision leaves unaccounted for the very strong attribution of intelligence, will, power, and all personal properties; which it would be perfectly absurd to apply to a visible splendour, or any symbolical phænomenon whatever; and it overlooks the *essential* part of the case, the clear and marked *distinction* which is preserved between the personal angel and him who sent him. It is this distinction, so widely different from the idea of a symbolical token, which makes the difficulty upon the Unitarian hypothesis. 3. That the being eminently called the angel of Jehovah is one who is, in certain respects or properties, *distinct* from God; and yet is, at the same time, truly and essentially THE SAME with God! And to this third conclusion he evidently considers the balance of evidence to incline. See *Dr. J. P. Smith on the Person of the Messiah*, vol. i.

ANGEL, in commerce, a gold coin formerly current in England, so named from having the representation of an angel upon it. It weighed four pennyweights, and was twenty-three carats and a half fine. It had different values in different reigns; but is now only an imaginary sum, or money of account implying ten shillings.

ANGELS, used metaphorically, are titles applied to bishops of several churches. In this sense St. Paul is to be understood where he says, Women ought to be covered in the church because of the angels. Dr. Prideaux observes, that the minister of the synagogue who officiated in offering up the public prayers, being the mouth of the congregation, delegated by them as their representative, messenger, or angel, to speak to God in prayer for them, was therefore, in the Hebrew language, called the angel of the church; and thence the bishops of the seven churches of Asia are called the angels of those churches.

ANGEL-FISH, in ichthyology, the ρινη of Aristotle, squatina of Pliny, monk or angel-fish of Ray, and the squalus squatina of Linnæus, a fish which connects the genus of rays and sharks. It differs from both in the situation of its mouth, which is at the extremity of the head; is extremely voracious and fierce, and like the rays feeds on flounders and flat fish.

ANGELET, an ancient gold coin equal to half an angel.

ANGELI (Peter), a distinguished Latin poet of the fifteenth century, a native of Barga in Tuscany. He became professor of ethics and politics in the university of Pisa, where he died in 1596, and wrote 1. Cynegeticon, or of the Chace, 1568; 2. Syrius, or the Expedition of Godfrey of Bouillon, for the recovery of the holy land, 1591; 3. De privatorum publicorumque Urbis Romæ eversoribus Epistola, 4to 4. Poesie Toscani, 8vo; 5. Letters in Latin and Italian, to be found in various collections; 6 Memoirs of his own life, &c.

ANGELIC GARMENT, angelica vestis, among our ancestors, was a monkish garment which laymen put on a little before their death, that they might have the benefit of the prayers of the monks.

ANGELICA, in botany, a genus of the digynia order, and pentandria class of plants; ranking in the natural method under the forty-fifth order, umbellatæ. The essential characters are. the fruit roundish, angled, solid, with reflected styli: COR. equal, and the petals incurvated. 1. A. arch-angelica is a native of Hungary and Germany. The leaves are much larger than those of the common angelica, and the flowers yellow. 2. A. atro-purpurea, 3. A. lucida, these two species are natives of North America, and have the additional epithet of Canadensis, from their abounding in Canada. 4. A. sativa, or common angelica, which is cultivated in gardens for medicinal use. 5. A. sylvestris grows naturally in moist meadows, and by the sides of rivers in Great Britain.

For the purposes of medicine, Bohemia and Spain produce the best kinds of angelica. The London college directs the roots brought from Spain to be alone made use of. Angelica roots are apt to grow mouldy, and to be preyed upon by insects, unless thoroughly dried and frequently aired. It is probable that the roots which are subject to this inconvenience, might be preserved by dipping them in boiling spirit, or exposing them to its steam, after they are dried. All the parts of angelica, especially the root, have a fragrant aromatic smell, and a pleasant bitterish warm taste. Angelica is one of the most elegant aromatics of European growth, though little regarded in the present practice.

ANGELICA WATER, a compound water in which the angelica root is the chief ingredient.

ANGELICA, WILD. See ÆGOPODIUM.

ANGELICA, in Grecian antiquity, a celebrated dance performed at their feasts. It was thus called from αγγελος, nuncius, messenger; because, as Pollux assures us, the dancers were dressed in the habit of messengers.

ANGELICÆ, or ANGELICS, a congregation of nuns, founded at Milan in 1534, by Louisa Torelli, countess of Guastalla. They observe the rule of St. Augustine.

ANGELICO DA FIESOLE (Giovanni), an Italian historical painter, was born at Fiesole in 1387, and died in 1455. He studied under Giottino, but afterwards became a monk of the order of St. Dominic. Pope Nicholas V. employed him in his chapel, and in miniature designs.

ANGELICS, ANGELICI, an order of knights, instituted in 1191 by Isaac Angelus Commenus emperor of Constantinople. Also in church his-

tory, an ancient sect of heretics, so called from their excessive veneration of angels; or according to others, from their maintaining that the world was created by angels.

ANGELICUS Pulvis, in chemistry, a name given by Schroeder and others to mercurius vitæ.

ANGELIERI (Bonaventure), a Sicilian monk of the order of St. Francis, who became vicar-general of his order at Madrid. He lived at the latter end of the seventeenth and beginning of the eighteenth centuries, and is author of Lux magica Celestium, Terrestrium, et Inferorum, 1685, 4to; Lux Magica Academica, pars secunda, 1687, 4to.

ANGELIS (Peter), an eminent artist of Dunkirk, born in 1695. He painted landscapes with figures and conversation pieces. He came to England about 1712, and afterwards went to Rome, where his works were much esteemed. On his return from Italy he settled at Rennes in France, where he died in 1734.

ANGELITES, in ecclesiastical history, a sect of heretics in the reign of Anastasius, and pontificate of Symmachus, so called from Angelium, where they held their first meetings. They were called likewise Severites, from Severus, who was the head of their sect; and Theodosians. They held that the persons of the Trinity were not distinctly divine, but only joint participants of a common deity.

ANGELN, or Anglen, a district of Selswick, Denmark, between the bay of Flensberg and the river Schley. It is about eighteen miles square, and contains a population of 29,000 inhabitants. The ancient inhabitants assisted the Britons against the Picts, and are thus supposed to have given its present name to England.

ANGELO (Michael de Buonarrotti), an incomparable painter, sculptor, and architect, born in 1474, in the territory of Arezzo in Tuscany. He was the disciple of Dominico Ghirlandaio, and erected an academy of painting and sculpture in Florence, under the patronage of Lorenzo de' Medici; which, upon the troubles of that house, he was obliged to remove to Bologna. About this time he formed a Cupid, which he carried to Rome, broke off one of its arms, and buried it in a place he knew would soon be dug up, keeping the arm by him. It was accordingly found, and sold to Cardinal St. Gregory for an antique; until Michael, to their confusion and his own credit, discovered the artifice and confirmed it by the deficient arm which he produced. At the desire of pope Paul III. he executed his most celebrated picture of the last judgment. M. Angelo has the character of being the greatest designer that ever lived; and it is universally allowed that no painter ever understood anatomy better. Sir Joshua Reynolds says, 'Were I now to begin the world again, however unequal I feel myself to that attempt, I would tread in the steps of that great master: to kiss the hem of his garment, to catch the slightest of his perfections, would be glory and distinction enough for an ambitious man. I feel a self-congratulation in knowing myself capable of such sensations as he intended to excite; and should desire that the last words which I should pronounce in this academy, and from this place, might be the name of Michael Angelo.' *Discourse to the Students of the Royal Academy*, 1790. He died immensely rich at Rome in 1654.

This is also the name of another painter of Milan, who has left a fine picture in the Dominican church of Antwerp.

Angelo St. a town in the province of Capitanata, Naples. It stands on a high mountain of the same name, in the cave of which there is a church dug out of the solid rock. The town is the see of a bishop, suffragan of Conza. Population 11,500. It is ten miles N. N. E. of Lauvia.

Angelo St., a considerable town of Italy, in the duchy of Milan, and district of Lodesano, on the Lambretto, six miles S. S. W. of Lodi.

Angelo, Civita di St., a town and marquisate of Naples, in the province of Abruzzo Ultra, situated on a mountain, and belonging to the ancient family of Pinelli, fifty miles E. N. E. of Aquila, and eighty-four north of Capua.

Angelo in Vado, St., a town of Italy, in the duchy of Urbino, on the river Metra, with a bishop, whose metropolitan is the archbishop of Urbino, twelve miles S. W. of Urbino.

ANGELONI (Francesco), a native of Terni in Italy, of which he wrote the history, 4to, 1646. He is principally known by an elaborate work published in folio, 1685, on the history of Rome, illustrated by ancient medals. He died at Rome in 1652.

ANGELOS, Los, a province of Mexico, the ancient republic of Tlascala, of which a city called Tlascala was once the capital. That city is now reduced to an inconsiderable town, and has given place to another called Puebla des los Angelos, or the city of angels.

ANGELOT, in coinage, an ancient English gold coin, struck at Paris while under the subjection of the English. There was another coin of the same denomination struck under Philip de Valois.

Angelot, in commerce, a small, fat, rich sort of cheese, formerly brought from Normandy.

ANGELUCCI (Theodore), a native of Belforte, in Ancona, author of Deus canzone spirituale di Cœlio magno, and a translation of Virgil's Æneid into Italian in verso sciolto, 12mo; also a work entitled Capitolo in code della Pazzia; Sententia quod Metaphysica sit eadem que Physica, 4to; Ars Medica, 4to; Exercitationum cum Patricio; and a treatise on the cure of malignant fevers. He died in 1600.

ANGELUS (Christopher), a native of Greece who after suffering many hardships and cruelties from the Turks, came over to England where he was well received. He taught Greek in the university of Oxford, and wrote several books particularly an acconnt of his own sufferings which is very interesting. It was printed in Greek and English in 1617. He died in 163[illegible]

AN'GER, *v.* & *n.* } Ang.-Sax. Ange, which
AN'GERLY, } with the Greek αγχω an
AN'GRY, } Latin *angere*, Wachter de-
AN'GRILY } rives from the German (o
Teutonic): Eng. bound; contracted. Pain
the subject arising from an inability to dila

itself, or expand to the extent desired. Hence applied to the body, signifying inflammation. In its other sense usually appropriated to the re-action of the mind with respect to an object which has excited displeasure.

And for so muche as ye thynkye your selues to bee wyse, I will *anger* you with a kynde of people, which in your iudgement is folyshe and beastlye, thereby to make you more enuyous.

Udall. Paul to the Rom. x.

That he, whiche erst a man was formed,
In to a woman was forshape:
That was to hym an *angry* iape,
But for that he with *anger* wrought,
His anger *angerlicke* he brought.

Gower. Con. A. book iii.

For an *angrie* man kindleth variaunce, and the ungodly man disquyeteth frendes, and putteth discorde amonge them that be at peace.

Bible, 1539. *Syrach.* c. xxviii.

Whenne ich ne may have þe maishe, suche melancholie suche take þat iche catche þerampe. þe carfiacle som tyme. oþer an ague in suche an *angre*.

Vision of Pier's Plouhman.

Who would *anger* the meanest artisan, which carrieth a good mind. *Hooker.*

Sometimes he *angers* me,
With telling me of the moldwarp and the ant.

Shakspeare.

Anger is like
A full hot horse, who being allow'd his way,
Self-mettle tires him. *Id.*

Why, how now, Hecat? you look *angerly*.

Id.

Such jesters' dishonest indiscretion is rather charitably to be pitied, than their exception either *angerly* to be grieved at, or seriously to be confuted. *Carew.*

So when the generous lion has in sight
His equal match he rouses for the fight;
But when his foe lies prostrate on the plain,
He sheaths his paws, uncurls his *angry* mane,
And pleased with bloodless honours of the day,
Walks over and disdains th' inglorious prey.

Dryden's Hind and Panther.

The maxim which Periander of Corinth, one of the seven sages of Greece, left as a memorial of his knowledge and benevolence, was χολου κρατει, be master of thy *anger*. *Johnson.*

Would'st thou Mundano prove too great, too strong,
For peevish Fortune's *angry* brow to wrong;
Renounce her power; banish fortune hence,
And trust thee to the hands of Providence. *Quarles.*

Whatever private views and passions plead,
No cause can justify so black a deed.
These, when the *angry* tempest clouds the soul,
May darken reason and her course control. *Thomson.*

Next *anger* rush'd, his eyes on fire,
In lightnings own'd his secret stings;
In one rude clash he struck the lyre
And swept with hurried hand the strings. *Collins.*

Anger, as a passion, has been called either deliberative or instinctive, and has its natural manifestation and uses as well as its unnatural and unjustifiable excesses. Bishop Butler observes that anger is far from being a selfish passion, since it is naturally excited by injuries offered to others as well as to ourselves; and was designed by the author of nature not only to excite us to act vigorously in defending ourselves from evil, but to interest us in the defence or rescue of the injured and helpless, and to raise us above the fear of the proud and mighty oppressor. Neither, therefore, is all anger sinful; and hence the precept, 'Be ye angry and sin not.' It becomes sinful, however, when it is conceived upon slight provocations, and continues long; being then contrary to the amiable spirit of charity, which 'suffereth long, and is not easily provoked.' Hence these other precepts of Scripture, 'Let every man be slow to anger;' and 'Let not the sun go down upon your wrath.' Such precepts suppose the passion of anger to be within our power; which consists not so much in any faculty we have of appeasing our wrath at the time, (for we are passive under the smart which an injury or affront occasions, and all we can then do is to prevent its breaking out into action,) as in so mollifying our minds by habits of just reflection, as to be less irritated by impressions of injury and to be sooner pacified. Our pious readers will remember the delicate and beautiful exhibition of this passion mingled with grief in the only perfect example of Christians. His whole soul was glowing with benevolence, he was watched, and accused by scribes and pharisees of profanity in the exercise of that benevolence—when Jesus Christ 'looked round about on them with anger, being grieved for the hardness of their hearts.' It was as when in nature the same cloud that contains the storm yields also the salutary and extinguishing shower. Dr. Paley, in his Moral and Political Philosophy, suggests many excellent considerations to allay this passion, as 'the possibility of mistaking motives; how often our offences have been the effect of inadvertency,' &c. 'But the reflection, calculated above all others,' he says, 'to allay anger, is that we ourselves are or shall be suppliants for mercy and pardon to the judgment-seat of God. Imagine our secret sins all disclosed; imagine us thus humbled, trembling under the hand of God; casting ourselves on his compassion; crying out for mercy—imagine such a creature to talk of revenge, refusing to be entreated, disdaining to forgive, extreme to resent what is done amiss; and you can hardly feign to yourself an instance of more impious and unnatural arrogance.' Physicians and naturalists instance many extraordinary effects of anger. Borrichius cured a woman of an inveterate tertian ague, which had baffled the art of physic, by putting the patient in a furious fit of anger. Valeriola made use of the same means with the like success in a quartan ague; and this passion has been sometimes equally salutary to paralytic, gouty, and even dumb persons; to which last it has sometimes given the use of speech. On the other hand the instances are not few in which it has proved injurious to the whole system. We meet with several instances of princes who have died in excessive fits of rage: e.g. Valentinian I., Wencessaus, and Matthias Corvinus king of Hungary. There are also instances wherein it has produced the epilepsy, jaundice, cholera morbus, diarrhœa, &c. It quickly throws the whole nervous system into preternatural commotion, by violent stricture of the nervous and muscular parts; and surprisingly augments, not only the systole of the heart and of its contiguous vessels, but also the tone of the fibrous parts in the whole body. It is likewise certain that

this passion, by the spasmodic stricture it produces, exerts amazing power on the stomach and intestines, the biliary and hepatic ducts, &c.

ANGER, a market town in Lower Austria, in the quarter of Lower Mannhartsberg, on the Morawa. It belongs, as well as the castle of Angermuhlen, to the family of Kinsky. Eight miles south of St. Polten.

ANGERAP, a river of Prussia, which uniting with the Inster, near Instersburg, forms the navigable river, Pregel.

ANGERBURG, a considerable town, the seat of a court of justice in East Prussia, circle of Schensten. It has a castle, 250 houses, 2400 inhabitants, and takes its name from the river Angerap. Adjoining is the lake of Grossmauer, famed for its eels. A considerable linen trade is carried on by the inhabitants; and they manufacture various articles of leather. It is fifty-five miles S. E. of Konigsberg. Long. 21° 55′ E., lat. 54° 7′ N.

ANGERMANIA, or ANGERMANLAND, a province of Sweden, in Nordland, 150 miles long, and from twenty-five to eighty broad, the widest part being to the east on the gulf of Bothnia. It is mountainous and woody, and in it are considerable iron-works. The chief town is Hernosand.

ANGERMANNIA, a river of Sweden, rising in the province of Asele Lappmark, and falling into the gulf of Bothnia. It is one of the noblest streams of Sweden, and is in some places as much as an English mile and a half broad.

ANGERMOND, or ANGERMUNDE, a town of the duchy of Berg, in Germany, on the east side of the Rhine, nine miles north, now included in the grand duchy of the Lower Rhine, and belonging to Prussia. Seven miles north of Dusseldorf.

ANGERONA, in mythology, a Roman goddess, so called, as some suppose, because she was said to drive away the disease, angina, the quinzy. She is represented with her mouth covered, to denote patience, and refraining from complaints. Her statue was set up, and sacrificed to, in the temple of the goddess Volupia, to show that a patient enduring affliction leads to pleasure.

ANGERONALIA, in antiquity, solemn feasts held by the Romans the twenty-first of December, in honour of Angerona, the goddess of patience and silence.

ANGERS, a city of France, in the department of Maine and Loire, situated near the confluence of the Sarte, the Loire and Maine, sixty-six miles west of Tours. This last river divides the city into two equal parts. Angers contains about 5420 houses, and 28,927 inhabitants. It suffered greatly during the Vendean war, and was the seat of a revolutionary tribunal. The castle stands on a rock, inaccessible on the side of the river, and flanked by eighteen towers and a half-moon. Before the revolution there was here a celebrated university, frequently resorted to by German princes, as well as a royal academy of belles lettres. The latter enjoyed the same honours and privileges as the Academie Française, and was composed of thirty members. Independently of the governor-general of Anjou, who was at the same time commandant of the town, Angers was the seat of a royal lieutenant, a bailiage, a prevote, a tribunal de commerce, a mint, and a government depôt for salt and tobacco. And it contained, exclusive of the cathedral, seven other chapters, seven abbeys for males and one for females, with a great number of convents for both sexes. The cathedral church is dedicated to St. Maurice, and is not less remarkable for its length than for the height for its nave, which is accounted one of the finest in France. Several ecclesiastical councils of note have been held in this town, particularly one in 1583.—Here are also manufactured fine camblets, beautiful stamine, serge, and other stuffs, hats, and all sorts of leather goods. Trade is flourishing, and the exports through the medium of the Loire, consist in white wine, brandy, grain, hemp, flax, fruit, and honey. The arrondissement of Angers comprises the middle of the western portion of the department, and has a population of 92,500 persons. The university of Angers was founded in 1398, and the academy of Belles Lettres, in 1683. At the end of the suburbs of Bresigny are the quarries of Angers, famous for fine slates, of the thickness of a crown piece, and a foot square. All the houses in Angers are covered with this slate, which has gained it the appellation of the black city. Much of the walls, with which king John of England surrounded it in 1214, remain, and are of very great circumference. Lon. 0° 30′ W., lat. 47° 28′ N

ANGERSTEIN (John Julius), a distinguished patron of the fine arts, born at St. Petersburgh in 1735, and who first came to England under the patronage of A. Thompson, esq. with whom he was partner in business upwards of fifty years. His celebrated collection of paintings, esteemed inferior to none of the same extent in Europe, has been purchased since his death by the English government at an expense of £60,000. Mr. A. died at Woodlands, Blackheath, January 22, 1822, aged ninety-one.

ANGETENAR, in the Arabian astronomy, a fixed star of the fourth magnitude, in the body of Cetus, or the whale.

ANGHIARI, a well-built town of Italy, in the grand duchy of Tuscany. Also a town near the Adige, in the Lombardo-Venetian kingdom, where the French were defeated by the Austrians in 1799.

ANGHIERA, a populous and fruitful country in Upper Italy, bounded by the Italian districts of Switzerland on the north, the provinces of Vercelli and Novara to the south, Milan Proper to the east, and the valley of Aosta to the west. It gives the title of a viscount. By the treaty of Worms in 1743, the empress Maria Theresa consented to make over to the king of Sardinia the part lying west of the Lago Maggiore, the remaining small division continuing annexed to Milan. Long. 8° 27′ E., lat. 45° 38′ N. Also, a small town of Italy, on the east bank of the Lago Maggiore, where the Ticino issues from that lake. Thirty miles N. W. of Milan.

ANGI, among physicians, tumours or buboes in the groin.

ANGIGLOSSI; from *αγχω*, to lie strait, and *γλωσσα*, the tongue; those who speak with hesitation or stammering.

ANGILDUM, in ancient authors; from an, one, and gild, price, Sax.; a simple gild, that is the simple value of any thing. It is distinguished from twigildum, a double compensation; trigildum, a triple compensation; &c.

ANGINA, in medicine, violent inflammation of the throat, otherwise called quinsy. See MEDICINE, Index.

ANGINA GANGRENOSA, or aquosa, the ulcerated, malignant, putrid sore throat, on which there are various treatises by Fothergil, Huxham, Northcoat, &c.

ANGINA LINI, in botany, a name used by some of the later Greek writers to express what the more ancient writers called linozostis; and the Latins epilinum; this was the cuscuta or dodder growing on the flax, as that on the thyme was called epithymum. It was called angina lini, the quinsy of flax, from its choking that plant.

ANGIOLELLO (John), an historian, was born at Vicenza. Being taken captive by the Turks, he was made slave to Sultan Mustapha, whom he accompanied in an expedition to Persia in 1573. He wrote the history of Mahomet II. in the Italian and Turkish languages; also the history of Ussun Cassan.

ANGIOPTERIS, in botany; from αγγος, a vessel, and πτερις, a fern. Class and order, cryptogamia filices; sect. exannulatæ. Nat. ord. filices dorsiferæ. Ess. Ch. capsules aggregate, in elliptical, crowded, masses, obovate, of two equal valves, and one cell, without a ring. This is one of those genera of ferns, which like danæa, gleichenia, and marattia, bear their capsules on the back of the leaf, or frond, without either a ring or involucrum. Those of the antiopteris, indeed, are not of many cells, like those of danæa and marattia, but perfectly simple. The only species described is, A. erecta, tall angiopteris, a native of the Society and Maria's islands.

ANGIOSPERMIA, in the Linnæan system of botany, the second order in the class didynamia. It consists of those plants of that class whose seeds are enclosed in a pericarpium. In this order the stigma is generally obtuse. They are the personati of Tournefort.

ANGITIA, the sister of Medea, who taught antidotes against poison and serpents, according to Sil. Italicus; though Servius on Virgil says that Medea herself received this name for the same reason.

ANGITIÆ LUCUS, or NEMUS, in ancient geography, a town of Naples, situated on the west side of the Lacus Fucinus, now called Luco.

AN'GLE, *n.*
AN'GLED,
AN'GULAR,
ANGULAR'ITY,
AN'GULARLY,
AN'GULATED,
AN'GULOUS.

Lat. *Angulus*, Gr. αγγυλον, from αγγυλοω, to curve, to bend.

Another answer'd, and said, it might wel be
Naturrelly by compositions
Of *angles*, and of slie reflections;
And saide that in Rome was swiche on.
Chaucer. The Squiere's Tale, v. i. p. 428.

A master cook! why he's the man of men,
For a professor! he designs, he draws,
He paints, he carves, he builds, he fortifies,
Makes citadels for curious fowl and fish;
Some he dry-ditches, some motes round with broths;
Mounts marrow-bones; cuts fifty *angled* custards.
Ben. Jonson's Mas. Nep. Tri.

The cyclops followed; but he sent before
A rib, which from a living rock he tore:
Though but an *angle* reach'd him of the stone
The mighty fragment was enough alone
To crush all Acis. *Dryden. Ovid's Me.*

Jewellers grind their diamonds with many sides and *angles* that their lustre may appear many ways. *Derham.*

Topazes, amethysts, or emeralds, which grow in the fissures, are ordinarily crystallised, or shot into *angulated* figures; whereas, in the strata, they are found in rude lumps, like yellow, purple, and green pebbles. *Woodward.*

ANGLE is otherwise defined the inclination of two lines meeting one another in a point. See GEOMETRY.

ANGLE Acute, Curvilineal, Rectilineal. See GEOMETRY.

ANGLE of Direction, Elevation, &c. See MECHANICS.

ANGLE OF INCIDENCE, in optics, the angle which a ray of light makes with a perpendicular to that point of the surface of any medium on which it falls; though it is sometimes understood of the angle which it makes with the surface itself.

ANGLE OF LONGITUDE, in astronomy, the angle which the circle of a star's longitude makes with the meridian at the pole of the ecliptic.

ANGLE OF PARALLAX, in astronomy, the angle made by two lines supposed to be drawn from the centre of a planet to the surface of the earth.

ANGLE OF REFRACTION now generally means the angle which a ray of light, refracted by any medium, makes perpendicular to that point of the surface on which it was incident; but has also been understood of the angle it makes with the surface of the refracting medium.

ANGLE of the Tenaille, Polygon, &c. &c. See FORTIFICATION.

To ANGLE. See ANGLING.

ANGLER, in ichthyology, the English name of a species of lophus. See LOPHUS.

ANGLES, an ancient German nation, originally a branch of the Suevi; who, after various migrations, settled in that part of Denmark, and duchy of Sleswick, which to this day is called Angel, and of which the city of Flensbourg is the capital. Here they were known, even in the time of Tacitus, by the name of Angli. The origin of this name is variously accounted for. According to Saxo-Grammaticus, they were called Angli from one Angulus, son to Humblus king of Denmark. Widischind, a Saxon writer, will have them to be called Angli, from an island in the corner or angle of the sea which they conquered. Goropius derives their name from the Saxon word Angel or Engel, signifying a fish-hook; the Angles, like the other Saxon nations, being greatly addicted to piracy. To this nation the British ambassadors are said to have applied when soliciting succours against the Scots and Picts. The Angles, therefore, came over in greater numbers than any other Saxon nation; and accordingly had the honour of giving the name of Anglia to England. See ENGLAND.

ANGLES, a town of France, in the department of Tern, near Castres, seated on a mountain near the river Agout.

ANGLES, in astrology, denote certain houses of a figure, or scheme of the heavens. Thus the horoscope of the house is termed the angle of the east.

ANGLESEY, or ANGLESEA, an island and county of North Wales, in the Irish Sea, separated from the main land of Britain by a narrow strait called Menai. It was the Mona of Tacitus (a name derived from the ancient British, Mon), and the Tir-mon of the Welsh. In figure it is an irregular triangle, indented with bays and creeks, and extending from north-west to south-east twenty miles, and about seventeen miles in breadth from north-east to south-west, calculating its length from Carnet's point to Bangor ferry, and its breadth from Llandwyn abbey to Penmon priory. It includes a superficial area of about 402 square miles. It has been known in history by various names. Its Roman name, Mon, is supposed by Rowland, in his Mona Antiqua Restaurata, to allude to its forming the termination of the British territories in this direction. Its name Ynys Dowyll, or the shady island, alludes to its having been formerly covered with woods and groves. It was called Ynys y Cedeirn from its powerful chiefs. Its present name originated from its conquest by Egbert, when it was called Anglesey, or the island of the Angles. Bede calls this and the island of Man the Menavian Isles.

From the accounts we have of the conquests of this island, both by the Romans and the English, the channel of Menai must have been much narrower than at present; and traces which still remain of an isthmus near Porthaeth-'hury have led some geographers to imagine that the island once joined the main land of Caernarvonshire. There is a curious historical document contained in the British Triadsiste to that effect. 'The three original islands adjoining to Britain were Orkney, Man, and Wight; and afterwards the sea broke the land, so that the Mon became an island; and in like manner Orkney was broken, so that there were a multitude of islands; and other places on the coasts of Scotland and Wales were broken by the sea, and became islands.' There is undoubted evidence of the encroachments of the sea upon the shore; the Lavan sands, in the bay of Beaumaris, formed a habitable hundred in the sixth century, when they were suddenly overwhelmed by the sea. The surface of this island is gently undulated, and the soil is nearly uniform, consisting of loam of different degrees of tenacity and fertility; that in the centre is a reddish earth. It is watered by twelve beautiful rivulets, the principal of which are the Allon, Llivon, Ffraw, Cefni, Braink. There are five ferries across the Menai straits, of which Port-hamel, or the Gloomy ferry (so called from the dense woods which in former times overshaded its banks), is celebrated as the place where Suetonius landed when he extirpated the Druids. Near Aberffraw, where the Ffraw enters the sea, is the lake Llyngoron, about two miles in circumference, abounding with trout, gwyniad, and other excellent fish. Off the eastern point is the steep rocky island of Priest-holme, or Puffin's island, which is frequented during the summer by various birds of passage. The puffin breeds there in immense numbers. Immediately to the north of Anglesey is the isle of seals, the sides of which are frequented by seals, and vast shoals of fish on which they prey. At the time when Wales was divided into six counties by Hen. VIII. this island formed one of them, and was subdivided into three hundreds. At present it comprises six hundreds, containing seventy-seven parishes; and, according to the returns of 1811, the number of houses was 7183, inhabited by 7706 families, of which 5376 were chiefly employed in agriculture, 1453 in manufactures, and 877 otherwise. The number of male inhabitants was 17,444; of females 19,601. There are several market towns, as Beaumaris the county town, Newborough, Llanerchymedd, Holyhead, Amlwich, and Llangefui; but markets are commenced and discontinued according to circumstances. The island sends two members to parliament, viz. one from Beaumaris and one from the county. It is in the province of Canterbury, and diocese of Bangor, and pays one part of the land-tax.

The climate is temperate, but is liable to fogs in autumn producing agues; while its exposure to the sea renders it unfit for the growth of the larger vegetables. That part of the island which lies on the borders of the Menai is finely wooded and there are some rich farms in the interior, and also along the coast opposite Caernarvonshire but much of the land lies undrained, and the general face of the country is flat and unpleasant. The harbours on the coast, as Beaumaris, Amlwch, Cremlyn, Dulas, Red-wharf, Holyhead &c. are convenient; Durlas bay is a considerable outlet for the lead mines. Aberffraw was anciently a port of consequence, and the chief seat of the prince of North Wales. The vegetable productions of this island are wheat, barley, and oats, of which 100,000 bushels are frequently exported in a year. 'Mon Mam Cynebry,' Anglesea is the mother of Wales, says Fuller, was a proverb in former times, 'because when other counties faill she plentifully feedeth them with provision, and is said to afford corn enough to sustain all Wales. Three thousand head of cattle were annually sent to England from the island one hundred and fifty years ago, a number which, forty years since, was augmented to from twelve to fifteen thousand. Large trunks of trees, preserved entire, and as black as ebony are frequently found in digging for turf, which is capable of being converted to domestic use. Anglesey is rich in minerals, many of which are curious and valuable. Quarries, yielding excellent breccia for millstones, and some fine marble quarries, are worked with success; the latter principally of the gray and white marble. A green amianthus, or brittle asbestos, is described by Pennant as growing in a marble of the same colour near Rhoscolin. Besides common limestone, white marble, and blue-veined marble, sulphate of barytes, an earth containing two fifths of pure magnesia, steatite, serpentine, fullers' earth, and native sulphur, are frequently found. Coal-mines have been opened at Malltraeth, and other places, which have been wrought with advantage; the depth of coal in proportion to the whole depth sunk being [illegible]

feet and a half in seventy-seven feet. An uncommon appearance in the natural history of this fossil is met with in Anglesey, viz. pedicles of loose coal of several ton's weight: copper ore is found within a few feet of the surface of the earth, and, instead of being disposed in veins, forms a connected mass in some places sixty feet thick. It is said to contain about 25 per cent. of metal; and the quantity annually obtained from the mines was formerly from 40,000 to 80,000 tons yearly, giving employment to 1500 miners. Of late they have not been equally productive: twelve or fifteen years ago 1000 miners were still employed; but in 1809 the number had decreased to 600. The mines of the Parys Mountain were ultimately explored in 1768, since which time they have been a source of incalculable wealth to the proprietors. See PARYS MOUNTAIN.

Abundant supplies of fish are found on the shores of Anglesey, and shell-fish in great varieties. The oysters are thought excellent, and the capture of herrings has been a great source of profit.

From the port of Holyhead the London mails and packets sail regularly for Ireland; in consequence of which it has received considerable attention from government within the last ten years; and the long entertained project of throwing a chain bridge across the strait of Menai, to connect the island with the main land, has just been completed. See MENAI BRIDGE.

Anglesey, according to several ancient chronicles, was the original seat of British Druidism, a fact which the book entitled Mona Antiqua Restaurata was written by Rowlands to prove. Here, therefore, was the abode of the sovereign Pontiff, or Arch Druid. One of its ancient names Ynys Dowyll is supposed by some to allude to the Druidical groves. On this island are twenty-eight cromlechs, conceived by antiquarians to be the bloody altars consecrated by the Druids to those sacrifices which found so prominent a feature in their system. These consist of a vast superficial stone or table in an inclined position, supported by from five to nine large pillars or stones. Instances also occur of the double trombech which is formed by a smaller one placed close to the end of the other, both being in an inclined position and surrounded by others at a short distance to the number of eight or nine. These are found in England, Ireland, and Scotland, but no where so frequently as in Anglesey. The most perfect stands in the marquis of Anglesey's park at Plas-Newydd.

Suetonius Paulinus invaded this island, A. D. 61, transporting his troops across the strait in flat-bottomed boats, while the cavalry swam over on horseback, and attacked the Druids in their last retreat. Before the Romans had well landed, the Druids called their votaries of both sexes around them. The women were seen with their dishevelled locks running amongst their countrymen with torches in their hands, echoing the horrid imprecations of their priests, whose followers made a vain resistance. Their horrid practice of sacrificing their captives, and consulting the gods in offering up the bodies of men, together with the opposition he met with, so incensed the Roman general that he cut down all the groves dedicated to their superstition, overturned their altars and temples, and threw all that escaped from the battle into fires which they had prepared for the destruction of himself and his army. The recall of the Romans to Britain by an unexpected revolt of some of the provinces, prevented at that time the final extirpation of Druidism. This memorable event was retarded for fifteen years, when, after a great loss both of blood and treasure, Julius Agricola subdued the island.

After the departure of the Romans from Britain, the Cambrian princes resumed their ancient sovereignty and Cadwallan, of the eldest branch of the Cynethian line of Druids, made Aberffraw the capital of the northern principality, which his successors retained as the centre of their authority till the conquest of the island by Egbert, and the formation of the Saxon heptarchy, when the ancient line of their princes ceased in the person of Llewellyn, A. D. 1282. The army of Egbert passed over by a bridge of boats at the same place where the Romans invaded the island (now called Moel y Don), one of the five ferries from the Welsh shore. Caswallon Llawhir, a prince of British origin, being sent here about the year 450 to expel some invaders, established a sovereignty in the island. Mr. Rowland affirms that he saw one of his charters. His descendants are said to have long retained the royal power, and to have given birth to Cadwallader the last king of the Britons. In the reign of William Rufus the earls of Chester and Shrewsbury assisted the inhabitants to repress an invasion of Griffith ap Conon prince of Wales. About this time Magnus king of Norway made a descent upon the island. Anglesey was now under the sway of its own sovereigns or subject to Wales. Tomb-stones have been found denoting the interment of princes, amongst whom Cadvan and Pabo have been particularized. Edward I. put himself in possession of the island without much difficulty, and established a bridge of boats across the Menai at the place where Agricola had crossed over into the island; but no sooner had the tide flowed up between the English army and the bridge, than the Welsh descended from their mountains and attacked it with great slaughter. The British sovereign retained possession of the island, and to overawe the natives fortified Beaumaris with a wall, and built a castle within the town, which was long governed by a constable and captain. Henry VIII. incorporated this island with his hereditary dominions, and afterwards constituted it a county of England endowed with the privilege of parliamentary representation. In 1648 it made a noble stand in favour of Charles I. when all the male inhabitants from sixteen to sixty took up arms in the royal cause. Since that period it has gone through many stages of improvement; and, though comparatively of small dimensions, has been found an important accession to the British crown.

Besides the cromlechs already alluded to, supposed by some to be sepulchral monuments,

and by others altars of sacrifice, there are several remains of architectural and monumental antiquity; and coins, implements and arms, both Roman and British are constantly dug out of the earth. But the copper-mines of Parys Mountain, and others in this part of the island, are supposed to have been known and worked by the Romans; a pool on the top of the mountain, having been distinguished long before the present works were formed, by the name of the mine-pool.

Anglesey lies at the average distance of 250 miles N. W. of London, Beaumaris 241, Holyhead 278.

ANGLESEY, earl of, son of the first viscount Valentia, took an active but not an honourable part in the troubles of king Charles I.'s reign; and, after siding alternately with the rebels and royalists, at length contributed materially to the restoration. He wrote, 1. Truth unveiled in behalf of the Church of England, &c. 4to. 1767. 2. A Letter from a Person of Honour in the Country written to the Earl of Castlehaven, &c. 3. The Privileges of the House of Lords and Commons, &c. 4. The King's Right of Indulgence in Spiritual Matters, &c. 5. Memoirs intermixed with Moral, Political, and Historical Observations, &c. 8vo. 1693.

ANGLIA, EAST, one of the kingdoms of the heptarchy, founded by the Angles that landed on the coasts of Britain under twelve chiefs; the survivor of whom, Uffa, assumed in 571 the title of king of the East Angles. This kingdom was bounded on the north by the Humber and the German Ocean, on the east by the same ocean, on the south by the kingdom of Essex, and on the west by Mercia. Its greatest length was eighty, and its greatest breadth fifty-five miles. It contained the two counties of Norfolk and Suffolk, with part of Cambridgeshire. The chief towns were Norwich, Thetford, Ely, and Cambridge. Earpwold, the fourth monarch, is said to have been converted to Christianity by the influence of Edwin king of Northumberland; but his wife, who was an idolatress, soon brought him back to her religion. After his death, and the inter-regnum that followed, Sigebert, who had been educated in France, restored Christianity, and introduced learning among the East Angles. Some writers state, that he founded the University of Cambridge. Ethelbert, who was the last sovereign of this kingdom, and who received his crown from Etheldred in 790, was treacherously murdered by Offa, king of Mercia, in 793; and from that time East Anglia was united with Mercia.

ANGLICA, in entomology, a species of pimelia, found in England, but very rarely. It is described by Fabricius, in his last arrangement, under the genus helops, and specific name pimelia. Gmelin makes a subdivision of the genus pimelia under the name helops, in which this is included. Also, a species of chrysomela, found in England. Forst. Nov. Ins.—*Fabricius.*

ANGLICANA, a species of altica, in the Fabrician arrangement, found in England.

ANGLICANUS SUDOR, the sweating sickness.

AN'GLICISE, *v.* } Modern Latin Anglus,
AN'GLICISM. } an Englishman, from Anglia, the Latinised name of England while under the dynasty of Saxon kings. To make English.

The same place and powers which γ had in the Greek language, he [the letter U] stood fully entitled to in the English; and that therefore of right he ought to be possessed of the place of γ even in all Greek words *Anglicis i.* *Edward's Can. Crit.*

They corrupt the language with their untutored *Anglicisms.* *Milton.*

ANGLICUS (Gilbertus), an eminent English physician, who flourished about the end of the thirteenth century. He wrote a Compendium of Physic.

ANGLIN, a river of France in the department of Vienne.

ANGLING.

'AN'GLING, } Ang. Sax. Angel, ahook; or the Belgic Anghel, or hanghel, hanghen, to hang. To entice by hanging out a bait; to endeavour to captivate; to allure; to entice.
AN'GLE, } or the Belgic Anghel, or hanghel, hanghen, to hang. To entice by hanging out a bait; to endeavour to captivate; to allure; to entice.
AN'GLER. } or the Belgic Anghel, or hanghel, hanghen, to hang. To entice by hanging out a bait; to endeavour to captivate; to allure; to entice.

And this is the most heauy fruit of yᵗ pleasure yᵗ is delectable in outward appearaunce and promising swete geare, I wote not what, while it hideth vnder the baite of pleasure the very *angling* hoke of death. *Udall. James*, vol. 2.

And I found that a womā is bytterer thē death for she is a very *angle* her herte is a nett and her handes are cheynes. *Bible*, 1539. *The Preacher*, c. vii.

I in these flowery meads would be;
These crystal streams should solace me;
To whose harmonious bubbling noise
I with my *angle* would rejoice,
Sit here, and see the turtle-dove
Court his chaste mate to acts of love.
Walton in Ellis, v. iii. p. 127.

What! shall I have my son a stager now; an *enghle* for players? a gull, a rook, a shotclog, to make suppers and be laughed at? Publius, I will set thee on the funeral-pile first.
Ben Jonson's Poetaster, act i. sc. i.

The ladies *angling* in the crystal lake,
Feast on the waters with the prey they take. *Waller.*

She also had an *angle* in her hand; but the taker was so taken, that she had forgotten taking. *Sidney.*

Give me thine *angle*, we 'll to the river there,
My music playing far off, I will betray
Tawny-finn'd fish; my bending hook shall pierce
Their slimy jaws. *Shakspeare.*

The patient fisher takes his silent stand,
Intent, his *angle* trembling in his hand;
With looks unmoved he hopes the scaly breed,
And eyes the dancing cork and bending reed. *Pope.*

A soldier now he with his sword appears;
A fisher, next, his trembling *angle* bears.
Pope's Vertumnus and Pomona.

Seest thou the wary *angler* trayle along
His feeble line, soon as some pike too strong
Hath swallowed the baite that scorns the shore,
Yet now, near hand, cannot resist no more.
Bp. Hall. Satire v

Of all ambitions man may entertain,
The worst that can invade the sickly brain
Is that which *angles* daily for surprise,
And baits its hook with prodigies and lies. *Cowper.*

Angling, as a species of amusement, has been pursued by amateurs of distinguished genius in the most enlightened parts of the globe, beguiled the solitude of poets and philosophers, id supplied the lover of nature with a fund of ational and elegant enjoyment; while as a fish- ng trade it has been practised with superior success by the ruder tribes of mankind. To this agreeable recreation men deeply immersed in the world often have recourse, that they may forget the tumult of life. It has been called the 'Contemplative Man's Recreation' by Isaac Walton, who has furnished the only text book of this recreation in the language.

Since angling assumes different modifications according to the fish for which it is intended, those usually taken by anglers first require illustration. We enumerate them alphabetically.

The Barbel is a dull heavy fish of considerable size and strength, and derives its name from its four barbs, two of which are at the corners of its mouth, and two at its snout. They shed their spawn about the middle of April, and come in season about a month or six weeks after that time. They root with the nose like a pig. Their usual haunts are among weeds. In summer they frequent the most powerful and rapid currents, and settle among logs of wood, piles, &c.; but in the winter they return to their deep bottoms. The baits are the spawn of trout, salmon, or almost any other fish, provided it be fresh; but as the barbel is very cunning, the pastes in imitation of it must be well made, and of fresh flavour. It is also recommended to bait the water over night by spawn or cut worms. The cob-worm, gentles, and cheese soaked in honey, are alike palatable to this fish; and he will bite at them eagerly. In angling for the barbel, the rod and the line must both be extremely long; and as the fish swims very close to the bottom, a running plummet should also be attached to the latter. By a gentle inclination of the rod, you may easily ascertain when there is a bite. Strike immediately, and the fish will seldom escape, unless he breaks the line.

Bream shed their spawn about midsummer, and though they are occasionally met with in slow rivers, are generally considered a pond fish, where they thrive in the greatest perfection, often weighing from eight to ten pounds. Dr. Shaw tells us that this fish is a native of many parts of Europe, abounding in the still lakes and rivers, and is occasionally found in the Caspian Sea. They are angled for near the bottom; and the angler should take all possible care to keep concealed.

The Bleak or Blay, so called from its bleak or white appearance, is a common river-fish that spawns about March. It is fond of many of the baits for trout, and is usually caught with a small artificial fly of a brown colour, to which the size of the hook should be proportioned. This fish, though highly valued by epicures, seldom exceeds six inches in length. Beads are made of its scales.

The Bull-Head, or Miller's-Thumb, is a small ugly fish, hiding in brooks or rivers under a gravelly bottom. They spawn in April, and their average length is from four to five inches Their flesh like the cray-fish turns red when boiled; and when their gill-fins are cut off they serve as good baits for pike and trout.

The Carp is a fish, that, by its frequent spawning and quickness of growth, is chiefly used to stock ponds, where it thrives better and lives longer than in rivers. It is supposed to be very long lived. Gesner, in particular, speaks of one which lived to be 100 years old. They spawn three or four times a year; but the earliest time is in the commencement of May. They live a long while out of water, and in Holland are frequently kept alive for three weeks or a month, by being hung with wet moss in a net, and fed with linseed steeped in milk. In angling for carp it is necessary to make use of strong tackle, with a fine gut next the hook, and a float formed of goose-quill. They are found near the bottom, and are rarely caught if angled for in a boat. From the subtlety which this fish possesses, it is frequently called the water-fox. The river-carp in the winter haunts the quietest and broadest parts of the stream, and in the summer lives in the deep holes and nooks under the roots of trees, and among great banks of weeds. The pond-carp loves a rich and fat soil. In Germany this species yields considerable income to the gentry. Its introduction to England has been ascribed to Mascall, who wrote a treatise on angling; but Pennant, in his British Zoology, disputes this claim, and quotes the following lines from the Book of St. Albans, by which he endeavours to prove that this fish was known here as early as 1496:—

Turkies, carps, hops, pickerel, and beer
Came into England all in one year.

The Chub or Chevin is like the perch a very bold biter, and will rise eagerly at a natural or artificial fly. They spawn in June, or at the latter end of May, and are then easily caught either by the fly, a large snail, or beetle with his legs and wings cut off. When they are fished for at mid-water or at bottom, a float should be made use of; when at top the proper way is to dib for them, or to use a fly in the same way as in trout-fishing. As they are a heavy fish, strong tackle is requisite, and they usually require a landing-net to pull them out. This fish is the squalus of Varro, and is common throughout England and the eastern part of the United States. The average length is from ten to fourteen inches.

The Dace, Dart, or Dare is a very active and cautious fish. They rise to a fly, but in angling for them it is needful to remain in concealment as much as possible. They spawn in February and March, and their flesh is of inferior flavour. They frequent clayey and gravelly bottoms, and deep holes if well shaded. The Thames is well known to abound in dace: the graining of the Mersey is thought to be of the same species.

The Eel is not very often angled for, but is commonly taken by the process of sniggling or

bobbing with night lines. As this fish is fond of quiet during the day, all who would enjoy the sport of eel-fishing must devote their evenings and even whole nights to the pursuit. The method generally employed is the following:—take a common needle, attached in the middle by fine wax twine to a line of packthread; on a strong small hook fixed to this line of packthread place a large lob-worm by the head end, and draw him on to his middle: affix another needle to the end of a long stick, and guide your bait with it into any of the known haunts of the fish; give him time to gorge the bait, and then by a sharp twitch fix the needle across his throat or the hook into his body; tire him well and your triumph is certain.

Bobbing is a rough species of angling. To effect it, provide yourself with a considerable number of good-sized worms, and string them from head to tail by a needle on fine strong twine, to the amount of a pound or upwards in weight. Wind them round a card into a dozen or fifteen links. Then secure the two ends of each link by threads. Tie a strong cord to the bundle of string-worms, about a foot from which put on a bored plummet, and angle with a line from two to three feet long, attached to a stout tapering pole. The two counties most celebrated for eels and pike are Lincolnshire and Cambridgeshire. Of two rivers in the former county is related the old proverb:—

> Ankham eel and Witham pike,
> In all England is none like.

In the county of Cambridge the Isle of Ely is supposed to have been denominated after this fish. Naturalists have been divided in their opinions with respect to the manner in which this fish is propagated. Walton imagined them to be bred of corruption, in the same way as wasps and some kinds of bees are; others contend for their being viviparous; but no certain information has at present been acquired upon the subject.

The lamprey is a species of eel, in high estimation; so called, says the quaint author of the Worthies of England, 'à lambendo petras,' from licking the rock. It is common in Worcestershire and Gloucestershire. The Severn lamprey perhaps excels. A pie is made of this fish annually by the city of Gloucester and presented to the king. In windy gloomy weather eels bite at the lob and garden worm designed for other fish. They are never out of season, and will at any time take a lamprey, wasp-grubs, minnows, &c.

The Grayling or Umber spawns in May, and is in the best condition about the month of November. They will greedily take all the baits that a trout does, and commonly frequent the same streams. They must be angled for with very fine tackle as they are a timid fish, and when hooked must be managed with care, as the hold in the mouth of this fish easily gives way; in that case however they will speedily return to the bait. They are on an average from sixteen to eighteen inches long; delicious to the palate; and are said to have the fragrant smell of the plant thymallus.

The Gudgeon, famous both for the flavour and sport, is a very simple fish, and easily allured with any kind of bait. It is fond of gentle streams with a gravelly bottom; is generally from five to six inches long, and spawns two or three times a year. Before angling for gudgeons the bottom should be well stirred up to rouse them, and collect them in shoals together. The fish should not be struck on the first motion of the float, as they commonly nibble the bait before they swallow it.

The Loach or Groundling sheds its spawn in April, and remains in the gravel, where it is easily taken with a small red worm. They are about three inches in length, of delicate flavour, and abound mostly in the north of Britain, and in the streams of the mountainous parts.

The Minnow is one of the smallest of river-fish, seldom exceeding two inches in length. They spawn once in two or three years, and crowd together in large shoals, chiefly in shallow waters, where, from their frequency in biting, they are easily taken, and serve as excellent baits for trout, pike, chub, perch, and many other kinds of fish.

Mullet take nearly the same bait as the trout, and will rise to an artificial fly. They are found in the river Arun, Sussex.

The Par or Samlet is called on the river Wye a skirling; in Yorkshire a brandling; in Northumberland a rack-rider; and in other parts of England a fingerling, from the resemblance of its spotted streaks to the human finger. Par or samlet is the name given it in Scotland, where it is best known. It has been supposed to be generated by the blended spawn of the trout and salmon, an opinion which receives great probability from the circumstance of their frequenting the same haunts with salmon and sea-trout, and their being forked in the tail like the former. They are taken mostly in the same way.

The Perch is a bold-biting fish, and affords excellent amusement to the angler. He is distinguished by the beauty of his colours, and by a large erection on his back which he can raise or depress at pleasure. Thus defended, he bids defiance to the attacks of the enormous and most ravenous pike. They are from eight to fourteen inches long, and spawn about the beginning of March. In fishing for perch with a minnow or brandling the hook should be run through the back fin of the bait, which must hang about six inches from the ground. A cork float is used, which is leaded about nine inches from the hook. They refuse a fly.

The Pike, Luce, or Jack, is a fish of enormous size and of the greatest voracity, so much so as to be called the fresh-water shark. They are great breeders. The account of their having been brought to England first in the reign of Henry VIII. is fallacious, although at that time they were esteemed great rarities. They shed their spawn about March, and usually in very shallow waters. The finest pike are those which feed in clear rivers, those of the fens being of very inferior quality. In the latter places however, they grow to a vast size, and feed principally on frogs and such like nutriment. The pike for longevity is the most remarkable of

fresh-water fish; is solitary and melancholy in his habits, commonly swimming alone, and remaining in his haunt till compelled to roam in quest of food. Gesner, in his letter to the emperor Ferdinand, introduced as a sort of preface to his book De Piscibus, relates that near Haileburne, in Germany, a pike was taken up in 1497 with the following curious inscription on a brass collar attached to his neck, 'Ego sum ille piscis huic stagno omnium primum impositus per mundi rectoris Frederici Secundi manus 5 Octobris anno 1230.' A high wind or dark cloudy day commonly affords the best sport in angling for this fish, as their appetite is keener at those times.

The PINNOCK, or AIBLEY, is a species of sea-trout, usually from nine to fourteen inches long, and is most frequent in Scotland. The whiting, another species, is from sixteen to twenty-four inches long. They will both rise at an artificial fly, but commonly require a more showy one than the trout.

There are three ways of taking pike by the ledger, the trolling or walking bait and the trimmer. The ledger is a bait fixed by a stick driven into the ground, or the angler's rod may be so secured; a live bait is attached to the hook, as the dace, gudgeon or roach, and on some occasions a frog is employed. A sufficient length of line is left free to allow the pike to carry the bait to his haunts. If fish are used as baits, the hook must be securely stuck through the upper lip, and the line should be from twelve to fourteen yards long. If a frog, the arming wire of the hook should be put in at the mouth and out at the side, and the hinder leg of one side should be fastened to it with strong silk. The method of trolling for pike is the most diverting way of catching them. There are several small rings affixed to the trolling-rod, and on the bottom and thickest joint a reel is placed, with twenty or thirty yards of line upon it. The line after passing through each ring of the rod, is joined to the gymp or wire to which the hook or hooks are suspended. Two large hooks, about the size adapted for perch-fishing, are commonly employed, which are placed back to back. Between the two hooks hangs a little chain, at the end of which is a leaden plummet fastened in the mouth of a dead fish, the hooks being left exposed on the outside. The bait being moved about in the water so as to resemble a living fish, the pike in perceiving it, immediately darts at it with all his velocity, and drags it to his hole, and in a few minutes voraciously devours it. The hooks by this means being fastened in his body, all that remains is for the angler to weary him out, and afterwards drag him slowly to the shore, being careful to avoid his bite, which he will not scruple to attempt. The third mode by which they are caught, is by means of a wooden cylinder, called a trimmer, round which about the middle in a smaller diameter twenty or thirty yards of line are wound, a yard or more being suffered to hang down in the water with the bait. The trimmer is now permitted to go wherever the current tends, and the angler silently follows, until a fish has approached the bait, when he comes up and secures him.

The new method of taking pike by means of fox-hounds, as he calls them, was originally suggested by Col. Thornton, and has been practised with considerable success. 'I make use,' says he, 'of pieces of cork of a conical form, all differently painted and named after favorite hounds. The mode of baiting them is by placing a live bait, which hangs at the end of a line a yard and a half long, fastened so slightly that on the pike's striking, two or three yards more run off so as to enable him to gorge his bait. If more line is used it will prevent the sport that attends his diving and carrying under water the hound, which being pursued in a boat down the wind, the course they always take affords very excellent amusement, and where pike or large perch, or even trout are in plenty; before the hunters (if I may so term these fishers) have run down the first pike, others are seen coming towards them with a velocity proportionable to the fish that is at them.' Whatever fish are employed in catching pike, they must be fresh, and preserved in a tin-kettle, which if the water be changed frequently will improve them. Pike are denominated jack till they attain the length of twenty-four inches.

The POPE or RUFF is a fish very similar in its nature and appearance to the perch, and is frequently caught when fishing for the latter. They spawn in March and April, and are taken with a brandling, gentles, or caddes. They are extremely voracious in their disposition, and will devour a minnow which is almost as big as themselves. In their favourite haunts of gentle deep streams overhung by trees, they swim in shoals together, and you may fish for them either at the top or the bottom of the water, as they will bite in almost any weather or almost any situation. The average length of this fish is from six to seven inches.

ROACH are frequently taken with flies under water. They are a simple and foolish fish, and will bite at any of the baits that are provided for *chub* or *dace*. They spawn in May, and turn red when boiled. The compactness of their flesh gave rise to the proverb, 'sound as a roach.' They haunt shallow and gentle streams; and particularly the mouths of all small streams which run into larger ones. In angling for the roach the tackle must be strong, and the float large and well leaded.

The RUD, or FINSCALL, is a very scarce fish found only in the river Charwell in Oxfordshire, and a few lakes in Lincolnshire and Yorkshire. It sheds its spawn in April, will take all kinds of worms, and rise at an artificial fly. Its colour is a yellowish brown, and its average length from nine to fifteen inches: it has been seen longer than this.

SALMON are accustomed to quit the sea at the commencement of April, and take to the rivers, and generally quit the fresh water and retire again into the sea at the approach of winter; but the Wye and Usk in Monmouthshire, and the Exe in Devonshire, have them in season all the six wintry months. The best and finest species of this fish is caught in the Exe, the Thames, and the Tamar; but they are not so numerous as in many other places. They prefer, generally speak-

ing, colder streams, and are therefore more numerous in the rivers of Scotland, particularly the Tweed, Tyne, Clyde, and Tay. In the latter they are often found seventy pounds in weight, and in the Tweed and Clyde fifty or sixty pounds. They are found in all the great rivers and streams of Europe north of 51°, and in America north of 41°; but in the American rivers they seldom exceed fifteen to twenty pounds in weight. They appear for some time in the river before they are in a healthy state, owing perhaps, in some degree, to the changes of water. The best time for the angler to begin to take them is the close of May, and the early part of June. In September and October they deposit their spawn, and grow very sickly both in appearance and flavour. Just before spawning, they retire to brooks and streams which branch out from the main river, or remain in the shallows scarcely covered with water, where they fabricate a kind of trough for the female to deposit her eggs in, which being done, the male sheds a whitish fluid over them, and afterwards the male and female unite to cover the whole with gravel, and conceal them with the greatest industry. The male is so diligent in this, that he frequently kills himself with fatigue, and always is longer in recovering than the female. The vivification of the spawn takes place with great rapidity about the commencement of April, when the sun has acquired sufficient strength to warm the bottom of the shoals where they are deposited. When the shoals are swelled by the spring floods, the young fry hurry downward to the sea. About July and August they return to the same rivers and remain till December, when they revisit the sea, and upon their return to the fresh waters the next summer, they attain the size, appearance, and flavour of salmon. They rarely or never forsake their parent streams. These fish are said to be forced from their salt-water residence by an insect which adheres closely to their bodies, called the sea-louse, which however drops off on their return to the fresh waters. After their second return to the fresh waters, they are subject to a gradual decline in health and appearance; their skin loses its silvery appearance, and acquires a dirty colour. Their heads grow very large; their flesh becomes loose and insipid; their scales seem almost rubbed off, and their gills are dreadfully infested with the lionea salmonea. In this stage they are called shotten salmon, and in their departure for the sea they make frequent stops, and seem almost unable of proceeding. The male shoots out a grisly excrescence from the lower jaw, which sometimes penetrates through the upper, greatly resembling the beak of a bird. Although they are delighted with clear rivers, which take their rise in mountains having a deep gravelly bottom, they uniformly avoid streams which flow upon ore, or amongst calcareous formations. When the warmth is intense, they retire beneath the shelter of trees; and are so susceptible of the vicissitudes of weather, that they leap about and express the most sensible emotions of joy at an approaching shower. They are, however, much alarmed at thunder-storms, and seek a close shelter in the bottom of the river. In fresh water they always lie with their heads pointing up the river, and never swim down the stream, unless during their emigration to the sea. The extraordinary leaps of this fish, as well as its characteristic food, have excited much attention. Being both bow and arrow, they shoot themselves out to an incredible height and length, says Fuller. Erecting themselves on their fins, they crowd to the bottom of a fall of twelve feet perpendicular, and spring up the precipice with the greatest confidence; and if unsuccessful in the first attempt, will make a second, and even a third. On the river Erich, called the Keith, there is a cataract of thirteen feet fall, which they uniformly leap. There is another in the Tivy, Pembrokeshire, which Drayton describes in his sixth song of the Polyolbion.

In angling for salmon the rod should be from seventeen to twenty feet in length. The reel should be made of brass, constructed with the utmost nicety, and capable of the swiftest circumvolutions. The line may be of silk or horse-hair, having a loop at the end of the wheel, and another at the cast line, to fasten them to each other. The last should be very carefully twisted, and shorter than the rod, that none of the knots may come within the rings. The line should be small towards the hook, where they are commonly made of three small round twisted silk-worm guts, or a few strong horse-hairs. Of flies, the natural ones that are proper are mentioned in the table; the artificial ones should be large, and of a gaudy glittering colour, composed of hairs, furs, and wool, mingled with the tail-feathers of cocks and game, secured together by gold and silver thread, plated wire, marking silk, bees' wax, shoemakers' wax, &c. The wings may be of fowls' feathers of a showy colour. A raw cockle or muscle, taken out of the shell, have been successfully employed as baits for salmon. The proper way of using them is to drop the line into some shallow, near the edge of some hole of a considerable depth, and let it be carried in by the current.

Considerable difficulty is experienced by young anglers in throwing the line. It should be cast across the river on the off side of the spot where you imagine the salmon will rise. When you think he has been struck, let him have time to swallow the bait securely, and afterwards stick the hook firmly in him by means of a gentle twitch. He will then plunge and spring with great violence; perhaps run away with considerable length of line, which should always be kept in a relaxed state so as to yield easily to his obstinate resistance. If he become sullen and quiet in the water, rouse him by throwing in stones, and when he again commences resistance, let him have plenty of line, following him down the stream till he exhausts himself, taking every opportunity to wind up your line till you approach him in this weary state, and take him gently by the gills out of the water. The most favourable time is when the sun shines watery, and when there is a fresh wind after a flood; also, when the water is slightly urged by the tide, so as it be not thick or muddy.

Smelts rise to a small fish on a paternoster line, or one armed with many hooks at suitable

distances; though being properly a sea-fish, they are not often caught with a line in rivers. In 1720 such an abundance of them occurred in the Thames, that the women and children lined the banks to angle for them between London and Greenwich. See *Walton*, editor of *Baxter's* edition.

The STICKLEBACK spawns in May, and is found in rivers, ponds, and ditches. Trout and pike rise easily at them, and when the prickles are cut off, they make excellent baits.

TENCH are considered pond-fish, though often found in the river Stour. They shed their spawn in July, and are in season from September till May. They bite freely during the summer months, but must be fished for near the bottom; and give them time to gorge the bait. Use strong tackle and a good goose-quill float, without cork. They are in general from twelve to fourteen inches long, though some have been caught as heavy as ten pounds.

TROUT are thought the finest river-fish in the country. They are of the most beautiful colours, varied according to the season of the year, and the rivers they frequent. They are found in the generality of our streams, and are usually taken with an artificial fly. They differ in weight from half a pound to three, and afford excellent diversion. They come to their size sooner than any other fish that we know, and are very short-lived. The time of shedding their spawn generally is about October and November, before which they often force a passage against the stream, through wears and flood-gates: and how they overcome some of these obstacles has been the subject of much conjecture. In some of the lakes of Ireland trout of large sizes have been caught: Walton quotes an instance of one being taken up forty-six inches long. They are generally found in eddies, where they remain concealed behind a stone, or a log, or a bank that projects into the stream. In the latter part of the summer they are frequently caught in a mill-tail, and sometimes under the hollow of a bank, and under the roots of a tree. In angling for trout, observe, 1. That the day be a little windy and the sky partially overcast; the south wind is the most desirable. 2. The angler should stand at a proper distance from the stream, and fish it downwards, the line never touching the water lest it should disturb the fish. 3. Clear streams are the most desirable, and a small fly with slender wings is the most appropriate. 4. The line should be about twice the length of the rod, except where trees, or other intervening objects, preclude the possibility of a successful throw at any distance. 5. The fly should suit the season. After a shower, when the water is of a brown appearance, the orange-fly is best; in a clear day the light-coloured fly; and in a gloomy day, in overshadowed streams, a dark fly. In angling with the fly it is important to strike on the first rise of the fish. The trout may be caught at the top, the middle, or the bottom of the stream. In angling for him at the top with a natural fly, use the green drake-fly and stone-fly, at least during the months of May and June. This mode of angling is called dipping. If there be no wind use a line half the length of the rod; but if there be a wind increase the length of the line. Let the line fly with the wind up or down the stream, and when you see a fish rise, guide the fly over him. In case of striking a fish, as you have no length of line with which to weary him, the capture must be effected by force. At midwater angling for the trout is performed by means of a small minnow, caddis, grub or worm. If a minnow be used, the moderately sized and whitest ones are the best, and should be placed upon a large hook, that it may be able to turn itself about when drawn against the stream. The hook may be inserted in the mouth and drawn out at the gills. It should be again drawn through the mouth with the point to the tail of the minnow, and the hook and tail neatly tied together, that the evolutions of the bait may be more naturally performed. The slack of the line should then be pulled back, that the body may be nearly straight on the hook. If he do not turn nimbly enough, let the tail be turned to the right or left, which by enlarging the orifice made in the body of the minnow, will greatly facilitate its movements. In angling with a worm or caddis, the finest tackle must be employed and a cork float. The lob-worm is the best in muddy water, and in clear streams the brandling. The first is used for large trout, the second for smaller ones.

There are two methods of angling at the bottom, with the float or with the hand. The latter is effected by means of a ground bait and long line, having one hair next the hook, and a little higher on small shot for a plumb. The brandling should be well secured and always in motion, drawn towards the person who is fishing. Only one worm is to be fastened on the hook at a time. To angle at the bottom with a float use the caddis, two or three of which may be put upon the hook at a time. It is often joined to the worm, and sometimes to an artificial fly. Fine tackle must be employed; and this mode of angling will afford diversion and success at all seasons of the year. In fishing with the caddis at the top of the water, the insect may be imitated by forming the head of black silk, and the body of yellow chamois leather; but the trout will seldom rise at the caddis when the stream is at all muddy. These observations are drawn from the most usual habits of successful fishermen, and are made with a view to practical convenience. For a more detailed and scientific account of the fish themselves, the reader is referred to the article ICHTHYOLOGY, as a branch of Zoology, and the separate articles respecting them.

We shall now give a few directions with respect to the tackle usually requisite for successful angling.

In the choice of his *rod* the angler will be directed by local circumstances. Cane rods are the lightest, and, generally speaking, should have the preference. In country places, where the angler commonly makes his own rods, the best wood that can be used is the common hazel. To this, however, should be added a sound ash stock, and a whalebone top. Practical anglers should, in the decline of the year, furnish themselves with eight or nine wands of hazel, taper-

ing toward the size of each other, in sets of three or four, and dry them during the winter in a chimney. By sloping off the ends of these to the length of two or three inches, and fastening them together with a waxed thread, a useful rod may be quickly formed. The whole should then be varnished over with Indian rubber dissolved in linseed oil, and a small quantity of seed or shell lac superadded, which will be an excellent preservative against the weather. Salmon rods are sometimes made wholly of ash, with a whalebone top. Excellent rods may also be formed thus: a yellow deal joint of seven feet; a straight hazel joint of six feet; a piece of fine-grained yew, tapered to a whalebone top, and measuring together about two feet. Experienced anglers always carry a jointed rod, when not in use, tightly looped up.

The *line* should gradually diminish towards the further extremity. No materials answer better than strong clean horse-hair, plucked from the middle of the tail, especially of a young and healthy gray or white stallion. Before plaiting they should be well sorted that the hair of every link may be of equal size with each other, and if washed should not be dried too rapidly. For ground fishing, however, brown, or at any rate dark hairs, are to be preferred, from their similarity to the colour of the bottom. Silk lines are seldom of much practical utility; they soon rot, and catch weeds.

The *hook* should be so tempered as readily to bend without breaking, and have a sharp point. It should be long in the shank and deep in the bed, the point straight, and true to the level of the shank, and the barb long; the size and sort depending on the kind of fish for which you propose to angle. The angler should be always provided with a variety.

Floats are formed of cork, porcupine quills, goose and swan quills, &c. In slow water, and for light fish, a quill float is best. For heavy fish or strong streams a cork float, which is best made by taking a sound cork, bore it through the centre lengthways with a small red-hot iron, round the top, and taper it down across the grain two-thirds the length, forming the whole into the shape of a pear. The float should be so loaded as to sink just below the surface of the water.

Although the origin of this art is involved in considerable obscurity, it is evidently of ancient date as appears from the allusions made to it among the Greek and Roman writers, and in the most ancient books of the Bible; as those of Job, Isaiah, Amos, Habbakuk, &c. A spirited turn is given to the prophetic descriptions of the destruction of Egypt in bishop Lowth's Isaiah:

> And the fishers shall mourn and lament;
> All those that cast the hook in the river,
> And those that spread nets on the face of the waters, shall languish.
> And they that work the fine flax shall be confounded,
> And they that weave net-work.
> And her stores shall be broken up;
> Even of all that make a gain of pools for fish.
> Isaiah, xix. 8—10.

Classical readers will recollect the occasion on which Cleopatra made such a gudgeon of Antony. He, according to Plutarch, having in the presence of the queen toiled all day and taken nothing, gave secret orders to some of his attendants to dive into the water and fasten several fine large fishes to his bait. Cleopatra perceived the stratagem, and, while she applauded his successes, privately sent down one of her slaves to hang a large salted fish of the Euxine upon his hook. When Antony thus detected exhibited considerable displeasure at being exposed to ridicule, she threw her arms round him, exclaiming, 'Resign, dear general, this kind of sport to us petty princes of Pharos and Canopus; your game is cities, provinces, and kingdoms.' It has been well said,

> What gudgeons are we men,
> Every woman's easy prey,
> Though we 've felt the hook, again
> We bite, and they betray.

Angling came into general repute in England about the period of the reformation, when both the secular and regular clergy being prohibited by the common law from the amusements of hunting, hawking, and fowling, directed their attention to this recreation. The invention of printing assisted in exciting attention to this subject, and made known its importance 'to cause the helthe of your body, and specyally of your soul,' as the first treatise concludes. Wynkin de Worde gave the world in 1496 a small folio republication of the celebrated *Book of St. Albans*. It contained for the first time a curious tract entitled the Treatyse of Fysshinge wyth an Angle, embellished with a wood-cut of the angler. This treatise is imputed to Dame Juliana Berners or Barnes, prioress of a nunnery near St. Albans. 'The angler (she observes) atte the leest hath his holsom walke and mery at his ease, a swete ayre of the swete sauoure of the meede floures that makyth him hungry; he hereth the melodyous armony of the fowls, he seeth the yonge swannes, heerons, duckes, cotes, and many other fowles, with their brodes, whych me seemyth better than alle the noyse of houndys, the blastes of hornys, and the scrye of fowles, that hunters, fawkeners, and foulers can make. And if angler take fysshe, surely thenne is there noo man merier than he is in his spyryte.' The Book of St. Albans contains 'Treatises perteynynge to Hawkynge and Huntynge,' as well as 'Fisshynge with an Angle;' and several editions of it were printed in the sixteenth and seventeenth centuries, as that under the title of The Gentleman's Academie, in 1595; The Jewel for Gentrie, in 1614; and The Gentleman's Recreation, in 1674. Mr. Haslewood, a learned bibliographer, has recently favoured the public with a well finished fac-simile reprint of the work, but he disputes the claim of the fair lady above mentioned to be the authoress of the above treatise on angling, and only assigns her a small portion of the treatise on hawking, the entire treatise on hunting, a list of the beasts of chase, and another of birds and fowls.

The only original works published between this performance and that by the celebrated Walton, were, A Book of Fishing with Hook and Line, and of all other instruments thereto

belonginge, made by L. M. (Leonard Mascall, a gentleman of Plumstead in Sussex), 4to. Lond. 1590. Certain Experiments concerning Fish and Fruit, practised by John Taverner, gent. and by him published for the benefit of others, 4to. Lond. 1600. The Secrets of Angling, teaching the choicest Tooles, Baytes, and Seasons for the taking of any Fish in Pond or River, practised and familiarly opened in three bookes, by J. D. Esq. (John Dennys or Davons), Lond. 1613, wherein is some beautiful poetry, quoted by Walton; and the Pleasures of Princes, or Good Men's Recreations; containing a Discourse of the general Art of Fishing with the Angle, and of all the hidden secrets thereunto belonging. Anon. 4to. Lond. 1614. Gervase Markham's Countrey Contentments, 4to. 1633.

Walton's Inimitable Discourse on Angling was first printed in 1653 in an elegant duodecimo, with plates of the most considerable fish cut in steel. This edition and three subsequent ones consisted wholly of what is now called part the first of the *Complete Angler*, or Walton's individual portion of the work. While engaged in 1676, being the eighty-third year of his age, in preparing the fifth edition, he received from his friend, Charles Cotton, Esq. a gentleman in Derbyshire, instructions how to angle for a trout or grayllng in a clear stream, as they were first called, which afterwards became Part the Second of this joint publication.

Angling has been thought of sufficient importance to be protected by statute. This first occurred in the reign of Edward I. when imprisonment and treble damages were awarded against all that should trespass on the rights of authorised fishers. By the 31st Henry VIII. c. ii. s. 2, it was enacted, If any evil-disposed persons shall fish in the day time, from six in the morning to six in the evening, in any ponds, stews, or moats, with nets, hooks, or bait against the will of the owners, they shall, on conviction thereof, at the suit of the king, or the party aggrieved, suffer imprisonment for the space of three months, and find security for their good behaviour. By the 5th of Elizabeth, c. xxi. s. 2, it is enacted, If any person shall unlawfully break or destroy any head or dam of a fish-pond, or shall wrongfully fish therein, with intent to take or kill fish, he shall, on conviction at the assizes or sessions at the suit of the king, or the party injured, be imprisoned three months, and pay treble damages; and after the expiration of the said three months, shall find sureties for good behaviour for seven years to come.

By the 22d and 23d Charles II., c. xxv. s. 7, it is enacted, That if any person shall, at any time, use any casting-net, drag-net, shove-net, or other net whatever; or any angle, hair, noose, troll, or spear; or shall lay any wears, pots, nets, fish-hooks, or other engines; or shall take any fish by any means whatsoever, in any river, stew, moat, pond, or other water, or shall be aiding thereunto, without the consent of the owner of the water, and be convicted thereof, within one month after the offence committed, such offender shall give to the party injured such satisfaction as a justice shall appoint, not exceeding treble damages; and pay the overseers of the poor such sum, not exceeding 10s., as the justice shall think fit: in default of payment, the said penalties to be levied by distress; or the offender to be committed to the house of correction, for a term not exceeding one month, unless he enter into a bond, with surety, in a sum not exceeding £10 never to offend in like manner. Justices are also authorised to destroy all such articles as before recited and adapted to the taking of fish, as may be found in the possession of offenders when taken. Persons aggrieved may appeal to the quarter sessions, whose judgment shall be final.

And by the 4th and 5th William and Mary, it is enacted, That no person (except makers and sellers of nets, owners of a river or fishery, authorised fishermen and their apprentices) shall keep any net, angle, leap, pike, or other engine for taking of fish. The proprietor of any river or fishery, or persons by them authorised, may seize, and keep to his own use, any engine which shall be found in the custody of any person fishing in any river or fishery, without the consent of the owner or occupier. And such owner, occupier, or person authorised by either, sanctioned by the consent of any justice, in the day-time, may search the houses or other places of any unqualified person, who shall be suspected of having such nets, or other engines, in his possession, and the same to seize and keep to their own use, or cut in pieces and destroy.

Stealing fish in disguise is made felony by the 9th George I. c. xxii. If any person armed and disguised shall unlawfully steal, or take away, any fish out of any river or pond (whether armed or not), shall unlawfully and maliciously break down the head or mound of any fish-pond, whereby the fish shall be lost and destroyed, or shall rescue any person in custody for any such offence, or procure any other to join him therein, he shall be guilty of felony without benefit of clergy. This (commonly called the Black Act) is made perpetual by 31st Geo. II. c. xlii.

By the 5th Geo. III. c. xiv. s. 1, it is enacted, That if any person shall enter into any park or paddock enclosed, or into any garden, orchard, or yard, belonging to, or adjoining to, any dwelling-house, wherein shall be any river, pond, moat, or other water, and, by any means whatsoever (without the consent of the owner) steal, kill, or destroy, any fish, bred, kept, or preserved therein, or shall be assisting therein, or shall receive or buy any such fish, knowing them to be such, shall, upon conviction, be transported for seven years. Persons making confession of such offence, and giving evidence against an accomplice, who, in pursuance thereof, shall be convicted, will be entitled to a free pardon.

And by the same act, s. 3, it is provided, That if any person shall take, kill, or destroy, or attempt to take, kill, or destroy, any fish in any river or stream, pool, pond, or other water (not being in any park or paddock enclosed, or in any garden, orchard, or yard, belonging or adjoining to a dwelling-house, but in any other enclosed ground, being private property), such person, being thereof convicted by confession, or the oath of one witness before a justice, shall forfeit five pounds to the owner of the fishery of such river or other water; and in default thereof

shall be committed to the house of correction for a time not exceeding six months.

By the 1st Eliz. c. xvii. all fishermen are forbidden to destroy the fry of fish, small salmon, and trout, under a penalty of 20*s.*; and by the 4th and 5th Anne, for the protection of salmon in the counties of Southampton and Wilts, no salmon shall be taken between the 1st of August and 12th of November. Statutes of George I. and II. forbid the same fish to be taken in the rivers Severn, Wye, Ware, Ouse, &c., under 18 inches long. It is held that where the lord of the manor has the soil on both sides of a river, as in the case of the Severn, the right of fishing goes with it; and he who intrudes thereon must prove his claim of a free fishery; but when the tide ebbs and flows, and the river is an arm of the sea, as in the case of the Thames, the right is presumed to be common, and he who claims a privilege must prove it.

ANGLO-CALVINISTS, a name given to the members of the church of England, because their doctrinal articles are built on the system of Calvin; though some modern writers allege that the doctrinal system of the English church is Arminian. The Anglo-Calvinists make one of the four branches of divisions of Calvinists, and stand distinguished from the pure Calvinists, the Piscatorians, and the Arminians.

ANGLO-SAXON, an appellation given to the language spoken by English Saxons; in contradistinction from true Saxon, as well as modern English.

ANGOL, a pleasant and well-watered city of South America, in the province of Chili, 125 miles north of Baldivia. Lon. 78° 20′ W., lat. 38° 10′ N.

ANGOLA, in geography, a small kingdom on the coast of West Africa, situated to the south of Congo. The limits are variously described by geopraphers. M. Degrandpré, a recent traveller in that quarter, states that the whole coast from Cape Lopez Gonsalvo to St. Phelipe de Benguela, extending from about the first to the twelfth degree of south latitude, is generally denominated the coast of Angola, while the whole of the interior has the name of Congo; and according to the expedition under Capt. Tuckey, the inhabitants of all this line of coast speak the same language, and are similar in their character, habits, and manners. The principal rivers are the Danda and the Coanza, diverging widely in the interior, but approaching to a contiguity of not more than seventy or eighty miles, whence they enter the Atlantic. The former is supposed to be navigable for about thirty leagues, and receives the Leucale and several inferior streams in its progress to the coast. The latter is a much larger stream, and has been navigated 150 miles inward as far as Cambambo, a Portuguese fortress. It is upwards of a league wide at its mouth, and is for several leagues upwards adorned with various islands. A remarkable range of mountains commences from the southern limits of Angola, now Cape Negro, running up the interior in a north-east direction. Their peaks are of considerable altitude, and are covered with perpetual snow; which melting in the summer rushes from them with great rapidity, forming several lakes and sheets of water contiguous to their base. Their exact dimensions have never been calculated; but, from their height and snowy appearance, the Portuguese have called them Monti Freddi, and Monti Nivosi; and the highest summit Cambambo, on which is a silver mine, guarded by the Portuguese with great jealousy. Large herds of wild cattle and mules adorn the plains, whilst lions, tigers, elephants, and several species of the rhinoceros infest the surrounding country. Between eight and twelve degrees of south latitude are found most of the tropical productions, particularly maize or Turkey wheat, together with the manihoc, imported from the West Indies, which forms a coarse kind of bread. The palm, the banana, and bocova trees, abound everywhere, and attain a height and beauty unusual in other countries. The most common of the palm species is a tree the fruit of which contains many kernels about the size of a filbert, of exquisite taste, and yielding an agreeable eating oil. Around the stem of this tree, which yields by incision a pleasant liquor, grows a beautiful downy moss; the leaves are large and strong, and are mostly used to thatch houses. Another plant found here resembles our apple-tree, affording a medicinal wax, or thin wax, in great esteem amongst the natives; and in the province of Chissama are some fine salt-pits, from which oblong cakes of salt, taken by the inhabitants, form an article of inferior merchandise. This country exhibits some valuable mineral productions; lead, silver, and even gold, being found here. The mines wrought by the Portuguese at Cabezzo are spacious. Large quantities of ore are also washed down by the mountain torrents, which the natives intercept by laying straw and other substances across the stream. Angola Proper was formerly a province of Congo, bounded by the river Danda on the north, the Coanza on the south, and extending to unknown limits of the interior on the east. The sovereigns of this district, however, becoming independent, conquered the kingdom of Benguela in the south as far as Cape Negro, in S. lat. 16° 21′, and extended the limits of Angola to its present dimensions.

The Portuguese writers relate that the country was originally divided into seventeen provinces; eleven of which, in the fifteenth and sixteenth century, became subject to the king of Portugal; also, that they found the natives a wretched cannibal race, preferring for food the flesh of man to that of animals, and always sacrificing human victims at their funerals, practices to which some of the southern tribes are still addicted. Twenty thousand natives, indeed, were said to have been converted to Christianity by the Portuguese missionaries between the years 1580 and 1590. Christianity, however, has made but little abiding impression upon them. In the first instance, from the disputes at that time

ripening between the kings of Congo and Angola, the Portuguese readily established themselves, and afterwards fanned the flames of war to procure slaves for their South American territories. In 1584 an army of 120,000 Angolians is said to have been routed by 500 Portuguese soldiers, with the assistance of 1,000 Congese; and in the following year 10,000 were defeated by 200 of the Portuguese. These raw undisciplined armies formed the militia of the country, of which the king of Angola compelled every chief to furnish a quota for the public service. Their instruments of warfare are the bow, the sword, the target, and the dagger, accompanied by the drums and European music introduced by their pious conquerors. In common with the other African tribes, they attack with savage shouts and violent fury, but a slight steady resistance defeats them. Not only the conquerors, but the natives, form themselves into parties and roam for captives in the interior. On some occasions they take with them considerable herds of cattle, which they drive towards a quarter where the population is numerous; after this they conceal themselves in the long grass, and, when the natives come to take the cattle, rush out upon them and carry them away.

St. Paulo de Loanda is a considerable and well-built town, the capital of the Portuguese settlements in this direction, and the see of a bishop. It is remarkable for the magnificence with which the Catholic church festivals are attended, as well as for that of its ecclesiastical and charitable edifices. Here is also a commodious port, with a sheltered roadstead half a mile in breadth; opposite to which is the island of Loanda, which supplies the city with water. This island is five leagues in length and one in breadth, presenting with its fine churches and convents a noble prospect from the sea. See LOANDA.

The commerce of the whole coast, and nearly our whole acquaintance with it, has arisen from the disgraceful traffic in slaves. Immense numbers of these unhappy beings are employed in the Portuguese provinces, whence they are continually transported to the Brasils. The Jesuits, who are the priests of the districts, are said to have at least between 1,000 and 2,000 under their control; and of those who are sold to European traders, this district has always afforded a copious supply.

Great Britain, during her long connexion with this trade, had no considerable intercourse with this part of the coast, and but one establishment in the neighbouring region; viz. at the mouth of the Congo. From the success of the Portuguese the Dutch were tempted hither; and the French, all the period of the revolution, largely shared in the slave adventures to Loanda, carrying off from 15,000 to 18,000 victims annually. Since the abolition of the slave trade by the British parliament, the trade on this coast has been concentrated in the hands of Spanish and Portuguese merchants, involving on an average the transportation of upwards of 40,000 human beings annually, of which the finest species are said to be procured from Malemba.

After having passed Cape Verde, the voyage to Angola is performed by one of two routes: the short route in which the vessels steer due east as far as Cape Lopez Gonsalvo; or what mariners call the long route, which after a south-west course from the Cape crosses the line about the twenty-third degree of west longitude, and in this direction continues as far as between the twentieth and twenty-fifth degrees of latitude; when the vessels commonly fall in with a propitious wind and tide for the coast of Africa. In the former course they have usually in the morning a land breeze, in the afternoon a south-west wind, and during the night a dead calm. The success of the short route depends upon the currents; if these are favourable the vessels are soon wafted to the haven; if otherwise, they are kept at sea for eight or ten months. The latter course, though it shows a greater extent of sea, being remarkably uniform in its winds, is subject to few vicissitudes, and may be calculated upon to a few days.

ANGOLENSIS, in ornithology, a species of falco, according to Gmelin, found in Angola, half as large again as the kite. It is described at length by Mr. Pennant, as found in the collection of R. Parry, Esq. Also a species of merops according to Gmelin; the apiaster angolensis, and le geuspier d'Angola of Brisson, or Angola bee-eater of Latham. Also a species of luxia inhabiting Angola the black grosbeak of Edwards, and Angola grosbeak of Latham. It is also the name of a species of emberiza, inhabiting Angola; the gros-bec à poitrine couleur de feu of Salerne, Latham, and Gmelin. This is the vengoline of Buffon and the Hon. D. Barrington. Linaria Angolensis of Brisson, and Angola finch of Latham.

ANGOLI, a name given by Buffon and others to the Madras gallinule, fulica maderaspatana of Gmelin.

ANGON, in the ancient military art, an engine of the bow kind. Others speak of it as a kind of javelin used by the French, the iron head of which resembles a fleur de lis. Hence it is the opinion of some writers, that the arms of France are not fleur de lis, but the iron-points of the angon, or javelin of the ancient Franks.

ANGONÆUS, musculus. See ANCONÆUS,

ANGONIA, or ANGOR, among ancient physicians, a concentration of the natural heat, occasioning palpitation of the heart.

ANGOSCIOLA (Sophonisba), a celebrated female artist born at Cremona, in 1533, of a noble family. Her instructors were Barnardino Campi and Bernardo Gatti, called Soiora. One of her first performances was the portrait of her father placed between his two children, which obtained universal applause. She also designed several historical subjects. In 1561 Sophonisba went to Madrid with her three sisters, and while there painted the portrait of Queen Isabella, which the king sent to Pope Pius IV. She returned to her native place in 1575, where, by continual application to her profession, she lost her sight. In this state she was visited by Vandyck, who used to say that he had received more practical knowledge of the principles of his art from a blind woman, than by studying all the works of the best masters in Italy. She died at Cremona

in 1626. She had three sisters, viz. Lucia, Europa, and Ann Maria, all celebrated painters of their time.

ANGOSTURA, a town of South America, in the province of Carthagena and kingdom of Granada. It is situated on the Magdalena, 140 miles north of Santa Fe de Bogota.

ANGOT, a province or kingdom of Abyssinia, bounded on the west by Amhera and Begemder, and on the east by the Doba and Foltol, barbarous tribes inhabiting the coast of the Red Sea. This province formerly was rich and fertile, when under the dominion of Abyssinia, but is now almost ruined by the Gallas, a nation wandering in the internal parts of Africa.

ANGOU, a province of Congo, situated on the northern bank of the river Zaire. The capital, Bomangor, is situated on the Zaire; but the chief commerce is carried on at Calenda.

ANGOULAM, in botany, a large and beautiful tree of Malabar, the juice of the root of which kills worms.

ANGOULEME, a city of France, the capital of the department of Charente sixty miles from Bourdeaux, and fifty miles west of Limoges. It is seated on the top of a hill, surrounded with rocks, at the foot of which runs the Charente. The inhabitants are about 14,000, and carry on a considerable trade in paper, which is their chief manufacture. There were formerly here ten convents and two abbeys, in one of which the old counts of Angouleme are interred: also a famous college of the Jesuits, and a large hospital. Lon. 9° 14′ E., lat. 45° 39′ N.

ANGOUMOIS, a ci-devant province of France now included in the departments of Charente, the Charente Inferior, the Dordogne, and the Deux Sevres.

ANGOURA, or Angyra, anciently Ancyra, a town of Natolia, in Asiatic Turkey, remarkable for its remains of antiquity. It is at present one of the best and neatest cities of Anatolia, and contains perhaps 40,000 inhabitants. The castle, which is as large as a small town, and well inhabited both by Christians and Turks, has a triple enclosure, and is built of white marble, and stone resembling porphyry. The streets are causewayed by blocks of granite; but they have no foot-paths. Here are seven churches belonging to Greek and Armenian Christians, besides several mosques for the Mahommedans. The country produces very good red wine, and excellent rice grows on the banks of some of the rivers. Opium, honey, and wax, are also considerable articles of trade in this part. In this neighbourhood there is the finest breed of goats in the world; their hair or wool is of a pure dazzling white, about nine inches long, and almost as fine as silk; a great trade is carried on in this article, and the finest stuffs, especially camblets, are made of it. The shawls of Angola rival those of Cashmire. Most of the inhabitants are employed in this manufacture. Angoura is 212 miles S.E. of Constantinople, and numerous caravans continually pass through this city.

ANGRA, a city of Terceira, and the capital of the Azores, and the residence of the governor. It is seated on the south side, on the edge of the sea. The harbour is of the form of a crescent, the extremities of which are defended by two high rocks, that run so far into the sea as to render the entrance narrow, and easily covered by the batteries on each side. From this harbour the town is said to derive its name, the word angra signifying a creek, bay, or station for shipping. The opening of the port is from the east to the south-west; and, according to Frezier, it is not above four cables length in breadth, and not two of good bottom. Here ships may ride in great safety during the summer; but as soon as the winter begins, the storms are so furious, that the only safety for shipping is the putting to sea with all possible expedition. Before these storms come on, the Pico, a high mountain in another of the Azores, is overcast with thick clouds, and grows exceedingly dark; but the most certain sign is the fluttering and chirping of flocks of birds round the city for some days before the storm begins. The town is well built and populous, the see of a bishop, under the jurisdiction of the archbishop of Lisbon. It is comprised of five parishes, and contains a cathedral, four monasteries, as many nunneries, besides an inquisition and bishop's court, which extends its jurisdiction over the Azores, Flores, and Corvo. This town was formerly surrounded by a good wall and strong fortification, but these through neglect are now in ruins. The old castle was celebrated for the imprisonment of king Alphonso VI. by his brother Peter II. in 1668. At Angra are the royal magazines, naval and military. All maritime affairs are under the inspection of an officer called desembergrador. The English, French, and Dutch, have each a consul residing here, though the commerce of any of these nations with the Azores is very inconsiderable, being only for wood, corn, and other provisions. Long. 27° 13′ W., lat. 38° 38′ N.

Angra de los Reyes, a city of Brasil, in the province of Rio Janeiro, situated on the coast of a small bay of the same name. It has two churches and a monastery. It is twelve leagues S. W. of the river Janeiro. Long. 44° 11′ W., lat. 23° 4′ S.

ANGRÆCUM, in botany; the epidendrum ovatum et scriptum of Linnæus.

ANGRIVARII, a people of ancient Germany, who inhabited that part of the country situated between the Weser and the Ems.

ANGROGNA, or Angrogne, a fertile mountainous district of Piedmont, accessible only by two passes from the south and east, and memorable for affording a safe retreat to the Waldenses many centuries before the reformation. The caves under the rocks afforded a safe asylum both to the people and their pastors.—There is here a small town of the same name, seven miles west of Pignerol.—Also, a small river which runs through the valleys of Piedmont, in the district of Angrogna.

ANGSANA, or Angsava, in botany; an Indian tree, which yields a gum often sold for the sanguis draconis, or dragon's blood. It is esteemed an astringent, and an excellent remedy in the aphthæ.

ANGUEAH, or Anguiah, a district of Abyssinia, through which runs a considerable river of the same name, which falls into the

Tacazze, fifty miles east of Axum. When Mr. Bruce crossed this river near Kellah it was fifty yards broad, although but three feet deep.

ANGUELLA, in ichthyology, the atherina hespetus of Linnæus.

ANGUIFER, or Anguitenens, in astronomy, a cluster of stars, so called from its resembling a man holding a serpent.

ANGUILLA, the most northerly of the Caribee islands, so named from its snake-like form; about ten leagues in length, and three in breadth. It was first discovered by the English in 1650, when it was filled with alligators and other noxious animals; but finding the soil fruitful they settled a colony on it. But the colony not being settled under any public government, the island became a prey to every rapacious invader. Their chief suffering was from a party of wild Irish, who landed here after the revolution, and treated them worse than any of the French pirates who had attacked them before. The people of Barbadoes, and other English Caribbees, knowing the value of the soil, several of them removed to Anguilla, where they remained for many years, and even carried on a profitable trade, though without any government either civil or ecclesiastical. In 1745 their militia, though not exceeding 100 men, defended a breast-work against 1000 French who came to attack them; and at last obliged them to retire with the loss of 150 men, besides carrying off some of their arms and colours, as trophies of their victory. Since that time the inhabitants have subsisted mostly by farming, though they still plant sugar; and the island is said to be capable of great improvements. It lies 100 miles N. of St. Christopher's. Long. 63° 10′ W., Lat. 18° 15′ N.

Anguilla, one of the smaller Bahama or Lucayos Islands, on the Anguilla Bank, which is, in fact, a collection of rocky islets to the north-west. This is about twenty miles long by five broad. Lat. 23° 36′ N., Long. 78° 50′ W.

Anguilla Bay, a bay on the north side of the island of St. John's, in the Gulf of St. Lawrence, opposite the Magdalen Isles. To the north-west it has Port Chimera and St. Peter's Pool in the south-east.

Anguilla, Cape, a promontory on the west side of Newfoundland, in the Gulf of St. Lawrence, distant from Cape Ray, the south-western extremity of the island, about six leagues. Lat. 45° 58′ N.

ANGUILLABA, a small town of Italy, in the papal territories, seventeen miles N. W. of Rome.

ANGUILLARA, a small town of Padua, situated on a lake of the same name, and containing 2860 inhabitants, six miles N. E. of Rovigo.

ANGUILLARIA, in botany, a name given to the ardisia excelsa and zeylanica of Linnæus.

ANGUILLARIS, in ichthyology, a species of the silurus of Linnæus.

ANGUILLIFORMES; from anguilla, an eel, and forma, shape; in ichthyology, a class of fishes which are soft and lubricous like the eel, and have no scales. Most of the fish comprised in this class are long-bodied also like the eel. Several of these, as the sea-serpent, conger, &c. are now included with the eel, in the Linnæan arrangement, in the genus muræna, and the others are chiefly referred to that of ammodytes ophidium, or petromyzon. The word is also applied to some kinds of worms.

ANGUINA, in botany, the calla and tricosanthes anguina of Linnæus.

Anguina, in conchology, a species of serpula that inhabits the Indian Ocean. The serpula muzicata of Born is a variety of this species.

Anguina, in natural history, a species of sertularia, called the snake coralline by Ellis; a native of the Mediterranean Sea.

Anguina, in zoology, a species of lacerta. This is vermis septentiformis ex Africa of Seba, and chalcides pinnata of Laur. This is common in muddy places about the Cape of Good Hope.

Anguina, in entomology, a species of phalæna, of the bombyx family, found in North America by Abbot, and described by Dr. Smith.

ANGUINEAL Hyperbole, in geometry, an hyperbola of a serpentine figure of the second order of curves.

ANGUINEI Versus, in poetry, verses the words or letters of which may be read backwards; such as the following:

Otto tenet mappam, madidam mappam tenet Otto.

ANGUINUM Ovum, the adder-stone, a fabulous kind of egg, said to be produced by the saliva of a cluster of serpents, and possessed of certain magical virtues. The superstition in respect to these was very prevalent among the ancient Britons, and there still remains a strong tradition of it in Wales. Pliny gives a similar account of it, lib. xix. cap. 3. Mason, in his Caractacus, thus perpetuates the description of Pliny.

> When in undulating twine,
> The foaming snakes prolific join;
> When they hiss, and when they bear
> Their wond'rous egg aloof in air
> Thence, before to earth it fall,
> The Druid in his hallow'd pall
> Receives the prize,
> And instant flies,
> Follow'd by the envenom'd brood,
> Till he cross the crystal flood.

This wondrous egg seems to have been nothing more than a bead of glass, used by the Druids as a charm to impose on the vulgar; whom they taught to believe that the possessor would be fortunate in all his attempts, and that it would gain him the favour of the great. The method of ascertaining the genuineness of this was no less extraordinary. It was to be enchased in gold, and thrown into a river; and if it was genuine it would swim against the stream. Our modern Druidesses, says Mr. Pennant, give much the same account of the ovum anguinum, glain neidr, as the Welsh call it, or the adder-gem, as the Roman philosopher does; but seem not to have so exalted an opinion of its powers, using it only to assist children in cutting their teeth, or to cure the chincough, or to drive away an ague. These beads are of a very rich blue colour; some plain, others streaked.

ANGUINUS, in entomology, a species of curculio found in Germany.

ANGUIS, or SNAKE, in zoology, a genus belonging to the order of amphibia serpentes. The characters of the anguis are these: they are squamous or scaly in the belly, and under the tail; without any scuta. The species, according to Gmelin, are striatus, meleagris, colubrinus, miliaris, jaculus, maculatus, reticulatus, cerastes, nasutus, lumbricalis, laticauda, scytale, eryx, fragilis, ventralis, platuros, lineatus, clavicus, annulatus, scutatus, corallinus, rufus, hepaticus, and tessellatus.

ANGUIS BIPES, or two-footed snake, is a native of the Indies; it has two short feet, with two toes near the anus. Gmelin has referred this, and also the anguis quadrupes, to the genus lacerta.

ANGUIUM LAPIS, a name given to a supposed stone in Germany similar to the anguinum ovum.

ANGUIUM SENECTÆ, in natural history, the exuviæ, or cast-off skins, of serpents, a decoction of which is good for pains in the ear, &c.

ANGULAR MOTION, in astronomy, is the increase of the distance between any two planets revolving round any body as the common centre of their motion. The quantity of this motion is expressed by two right lines, drawn from the centre to the revolving bodies; which will open wider, and consequently the angle will grow greater, as the revolving bodies part farther from one another. The angular motions of revolving bodies are as their real or absolute motions directly, and as their radii of motion inversely: they are also reciprocally proportional to the periodic times.

ANGULARIS ARTERIA, in anatomy, another name for maxillaria.

ANGULARIS SCAPULÆ, in anatomy, another name for the levator scapulæ.

ANGULATA, in zoology, a small species of lacerta, first discovered in America by Rolander.

ANGULATA, in entomology, a species of hispa found in Cayenne. Also a species of phalæna of the bombyx tribe. Also a species of pimelia inhabiting Egypt, the tenebrio asperrimus of Pallas. Also a species of phalæna of the geometra tribe. Also a species of cantharis found in the South Sea Islands. Also a species of aranea.

ANGULATA, in conchology, a species of tellina found in the Indian Ocean. Also a species of anomia generally found in a fossil state.

ANGULATUS, in zoology, 1. a species of coluber; 2. a species of gryllus.

AN'GUOUR, *n.* } *Anguour*, Fr. *angoisse*.
AN'GUISH, } From the same root as anger. Denoting excessive
AN'GUISHED, } vexation and distress of
AN'GUISHOUS. } mind; distinguished from anxiety.

þe fader kyng Henry [the second] in herte had he payne,
And *anguised* greuously, þat Thomas was so slayn.
R. Brunne, p. 132.

Aghe corynthis, ghe ben not *anguischid* in us,
but ghe ben *anguischid* in ghoure ynwardnessis.
Wicklif. Corynth. vii.

Some with grete processyon in gret *anguyse* and fere
Wepynde byuore þe kyng, and her relykes myd hem bere,
And oþer holy chyrche bynges bare vorbe echon.
R. Gloucester, p. 177.

There is perhaps not in all the stores of ideal *anguish* a thought more painful than the consciousness of having propagated corruption by vitiating principles; of having not only drawn away others from the paths of virtue, but blocked up the way by which they should return; of having blinded them to every beauty but the paths of pleasure; and deafened them to every call but the alluring voice of the syrens of destruction. *Rambler.*

Let no man who owns a Providence grow desperate under any calamity or strait whatsoever; but compose the *anguish* of his thoughts upon this one consideration, that he comprehends not those strange unaccountable methods by which Providence may dispose of him. *South.*

At his control,
Despair and *anguish* fled the struggling soul,
Comfort came down the trembling wretch to raise,
And his last faultering accents whisper'd praise.
Goldsmith.

ANGURIA, the water-melon: a genus of the diandria order, and monœcia class of plants; natural order, thirty-fifth, cucurbitaceæ. The essential characters are: CAL. quinquefid: COR. quinquepetalous: the female calyx and corolla the same: PERICAR. a pome beneath, with two cells: SEEDS, numerous. Of this genus, Linnæus reckons three species, viz. 1. A. pedata. 2. A. trifoliata. 3. A. trilobata. Of these only one species is known in this country, by the name of citrul. The fruit is cultivated in the warm countries of Europe; as also in Africa, Asia, and America; where it is esteemed on account of its wholesome cooling quality; but in England it is held in little estimation.

ANGURIA CITRULLUS, in botany, the cucurbita atrullus of Linnæus.

ANGUS, a district of the county of Forfar in Scotland; formerly an earldom in the Douglas family, now extinct. See FORFAR.

AN'GUST, *adj.* Lat. *angustus*, narrow. Narrow, constrained, straitened.

As Peter Nonius will have the aire be so *angust*, what proportion is there betwixt the other three elements and it? To what use serves it? Is it full of spirits which inhabit it, as the Paracelsians and Platonists hold the higher the more noble, full of birds, or a mere vacuum to no purpose?
Burton's Anat. of Mel.

The cause may be referred either to the grumousness of the blood, or to obstruction of the vein somewhere in its passage, by some *angustation* upon it by part of the tumour. *Wiseman.*

ANGUSTATA, in entomology, a species of cassida, a native of India. Also a species of pimelia, a native of the southern parts of Russia and Egypt, and is supposed to be the tenebrio longicornis of Pallas.

ANGUSTATA, in conchology, a species of lepas. Also a species of cypræa.

ANGUSTATUS, in entomology, a species of curculio, sometimes found in England. Also a species of cryptocephalus according to Gmelin the cistella of Fabricius; a native of England. Also a species of carabus, a native of Germany. Also a species of cimex.

ANGUSTICLAVIA; from angustus, narrow, or small, and clavus, a stud; in Roman antiquity, a tunica embroidered with small purple studs. It was worn by the Roman knights, as the laticlavia was by the senators.

ANGUSTURA Cortex, a species of bark which comes from the Spanish main, and is a very powerful bitter. It is imported here in convex pieces, about an inch and a half in breadth, and about six inches long. It is hard and compact, of a yellowish-brown colour, and covered with a whitish uneven epidermis. In powder it has the yellow appearance of rhubarb; its taste is bitter and aromatic, and its odour, when recent, is said to be not ungrateful.

ANGUSTUS, in entomology, a species of cimex, a native of China.

Angustus, in conchology, a species of murex.

ANHALDIN, or Anhaldina, an epithet given to various medicines, formerly kept as secrets in the family of Anhalt.

ANHALT, or Anholt, an island of Denmark, in North Jutland, lying in the Categat, eight miles from the coast of Jutland, and ten from Zetland. The coast is dangerous for seamen, for which reason there is a light-house erected on it. The English took possession of it in 1810, and made it a place of rendezvous for the North Sea squadron. They were attacked by three divisions of Danes, with gun-boats; but the Danes were repulsed with the loss of two divisions and several gun-boats.

Anhalt, a principality of Germany, in the circle of upper Saxony. It is a long narrow tract, situated for the most part betwixt the rivers Elbe and Saal, about sixty miles in length from east to west, but of unequal breadth, the greatest being on the east side, which is twenty-five miles, and other parts not exceeding nine. It is bounded on the south by Halberstadt, on the east by the duchy of Saxony, and on the north by the duchy of Magdeburg. It abounds in corn, and is watered by the Salde and Mulda; its principal trade is in beer. Cattle and wood form the chief articles of export; but the quantity of the manufactures is not proportioned to the size of the country. The religion, both of the inhabitants and of the reigning princes, is the Calvinist, but Lutherans are by no means uncommon. The house of Anhalt, from whence the electors of Saxony and Bradenburg are said to derive their original, is a very ancient family. They deduce their origin from Berenthobaldus, who made war upon the Thuringians in the sixth century. Joachim Ernest, who died in 1586, left five sons who divided the principality among them, and thus gave rise to the five branches of the family of Anhalt, viz. 1. Anhalt-Bernburg, 2. Anhalt-Coethen, 3. Anhalt-Dessau, 4. Anhalt-Schaumburg; Anhalt-Zerbst is now entirely extinct. All these princes having children, and being of equal authority, they unanimously agreed to submit to the eldest of the family, which is Anhalt-Dessau, who has the supreme government. The inhabitants of these little independent sovereignties live in great affluence. These petty princes possess lands sufficient for their expenses, the revenues being reckoned about half a million of dollars. The tax on lands is 4 per cent., which, rating them at twenty years purchase, is not quite one shilling in the pound. Upon an emergency the subjects are able to raise half a million extraordinary. The towns in these little states are not so numerous in proportion to the extent of country as in Saxony, but better peopled.

ANHALTINA, in medicine, those medicines which promote perspiration; also a cordial distilled from aromatic ingredients.

ANHANG', *v.* To hang. See Hang.

And right anon, the ministers of the toun,
Han hent the carter, and so sore him pined,
And eke the hosteler so sore engined,
That they beknew hir wickednesse anon,
And they were *anhanged* by the necke bon.
Chaucer. The Nonnes Preestes Tale, vol. ii. p. 184.

'Do way,' said Guy, 'therof speake nought!
By him that all this world hath wrought,
I had liever thou were *anhong!*
Ac thou hast armes great plente;
I wis thou must lend me
One of thine axes strong.'
Ellis. Romances, vol. ii. p. 84.

ANHELATIO, or Anhelitus, among physicians, a panting, or shortness of breath.

ANHIMA, in ornithology, a Brasilian bird somewhat resembling the crane. On its head is a long single horn inserted a little above the origin of the beak, and standing forwards, a little bent downwards. This is of two or three fingers breadth long, and is slender and round, of a bony substance, and fine white colour; and on the front of each wing it has two other such horns growing from the substance of the bone. It is found about waters, and is a very voracious bird, but feeds only on vegetables. It is longer than a swan; and is of a mixed colour of black, gray, and white, with a little yellow in some places. They are always seen male and female together; and the male is twice as large as the female, which is here described, and is larger than our swan. It makes a very loud noise, often repeating the notes, vyhu, vyhu. It is the palamedia cornula of Linnæus.

ANHINGA, in ornithology, an elegant Brasilian water-fowl, about the size of the common duck. Its beak is straight and sharp; its head is small, and its neck slender and long; its legs are short, and its toes connected by a membrane, as in the cormorant and duck kind; its wings, when folded, reach not more than half the length of the tail; its head and neck are yellowish, and covered with extremely soft velvet-like feathers; its breast, belly, and thighs, are of a silvery white; the upper part of its back is brown spotted with yellow, and the rest all black; it is common on the Brasilian shores, and feeds on fish. It is a species of the plotus.

ANHLOTE, in law, a term used to express, that every one should pay, according to the custom of the country, his part and share, as scot and lot, &c.

ANHUBA, in botany, the sassafras tree.

ANHYDRITE, in mineralogy, anhydrous gypsum. The varieties of it are six: 1. Compact: the colours are white, blue, and red. 2. Granular or scaly; colours blue, of a pearly lustre. Both these are found in salt-mines, in

Europe. 3. Fibrous; colour nearly white. 4. Radiated; blue, spotted with red. 5. Sparry, or cube spar; milk white, found in Switzerland. 6. Siliciferous, or vulpanite; bluish or whitish gray.

ANHYDROS, in botany, a name given by the ancient Greeks and Romans to one of those kinds of strychna, or night-shade, which, when taken internally, caused madness.

ANI, in ornithology, the name of a Brasilian bird, somewhat allied to the paraquet kind. It is about the size of a thrush, and is all over black. It is very common in the woods, but is not eaten. This is a species of crotophagi.

ANIAN, a barren sandy desert lying on the east coast of Africa, containing but very few inhabitants except wandering Arabs.

ANIANE, a town of France, in the department of Herault, arrondissement of Montpelier, at the foot of the mountains, near the river Arre.

ANIBA, in botany, the cedrota of Linnæus.

ANICETON, in medicine, a plaster described by Galen. Also an epithet for the anisum and anethum.

ANICETUS, a Syrian who succeeded pope Pius I. A. D. 156, in the reign of the emperor Antoninus, according to the chronicle of Alexandria. According to Eusebius he died A. D. 167, having governed the church for eleven years.

ANICIUS, the first Roman senator who embraced the Christian faith.

ANICH (Peter), an ingenious mathematician, born at Oberperzuff, near Inspruck, in 1723. He made an elegant pair of globes for the university of Inspruck, and constructed different mathematical instruments. He also drew maps and charts with the greatest accuracy and neatness. He died in 1766, and the empress queen, as a a testimony of regard to his merit, settled a pension of fifty florins a year on his sister.

ANICHINI (Lewis), a celebrated seal engraver, a native of Ferrara in Italy, whose medal of the interview between Alexander the Great and the High Priest at Jerusalem, was so exquisitely engraved, that Michael Angelo declared that the art was arrived at the height of perfection.

ANICIA, the surname of Proba Falconia, the wife of Anicetus, and the mother of the consuls Olibrius and Probus. From different parts of the verses of Virgil, collected into cantos, she composed a life of Christ, which has been much admired for its ingenuity.

ANICULA, in conchology, the conus monachus of Linnæus.

ANICULUS, in entomology, a species of cancer, the largest of the family of parasitici.

AN'IENT, *v.* } Fr. *anéantir*, to annihilate.
ANIENT'ISE. }

That wikked liche, and wilfulliche, wolde mercy *anyente*. *The Vision of Pier's Plouhman.*

ANIGHT'. On night. In the night.

As Edmond sat myd ys ost *anyȝt* in such solas,
And folc myȝty, þat ver wounded and sor and wery was,
And speke of þys bataýle, hou ýet myȝte be god:
An olde knyȝt per ros vp, by wore bys folc stode.
R. Glouœster, p. 305.

He mot one of two thynges chese,
Where he woll haue hir suche *on night*,
Or els vpon daies light.
For he shall not haue both two.
Gower. Con. A. b. i.

Sir Toby, you must come in earlier *anights*; my lady takes great exceptions at your ill hours.
Shakspeare.

ANIGOZANTHUS, in botany; from *ανοιγω*, to expand or be apparent, and *ανθος*, a flower. Order monogynia, class hexandria. Its generic characters are: CAL. none: COR. monopetalous: STAM. filaments six awl-shaped; anthers linear oblong: PIST. germ. inferior, oval: STYLE, thread-shaped ascending, on a level with the stamina, deciduous: STIGMA, undivided, tumid: PERIC. capsule nearly spherical, of three cells and three valves, crowned with the permanent corolla, bursting at the summit: SEEDS numerous, angular, and inserted into the inner angle of each cell. The species are two, viz. 1. A. rufa, red anigozanthus. 2. A. flavida, russet-green anigozanthus. Both these are natives of New Holland.

ANIL, in botany, the indigofera tinctoria of Linnæus.

AN'ILITY, *n.* Lat. *anus*, an old person. So called from length of years; old age; dotage.

Since the day in which this formation was begun by how many strange and critical turns has it been perfected and handed down, if not 'entirely without spot or wrinkle,' at least without great blotches or marks of *anility*. *Sterne's Sermons*

ANJEDIVA. See ANGEDIVA.

ANJENGO, a small town and factory, with a fort, on the coast of Travancore, in the peninsula on this side the Ganges, belonging to the East India Company. The fort is small, but neat and strong. At the close of the seventeenth century (1694), the English East India Company obtained leave of the queen of Attenja to fortify this spot (enclosed by a deep and broad natural stream) for the protection of their pepper and cardamonis trade with the rajah of Travancore. The works have been since kept in good condition. Not far from the town is Attenja, the residence of the queen of Travancore, a title which is taken by the king's eldest sister. Good cables are made here of the Laccadive cocoa nut.

This settlement supplies our East India Company with pepper and calicoes; and its situation is also very convenient, for giving proper intelligence to our ships touching here from Europe or India. Long. 76° 51′ E., lat. 8° 29′ N.

ANJIRIC, a considerable village on the Java shores of the Straits of Sunda, where ships may be supplied with every kind of refreshment but they seldom touch here, as the calms which frequently occur would occasion delay. At this place Colonel Cathcart is interred, who died on his way to China as ambassador in 1785.

ANIMA, among divines, the soul, or principle of life, in animals. See SOUL.

ANIMA, in music, with life and spirit, a degree of movement similar to vivace, being a medium between allegro and largo.

ANIMA, in chemistry, is applied to bodies exalted by solution and extraction to a high degree of power. In this sense we meet with anima aloes, anima saturni, anima veneris, &c.

ANIMA HEPATIS, sal martis.

ANIMA MUNDI, in philosophy, the soul of the world or universe, a certain pure etherial substance or spirit, which was said by some ancient philosophers to be diffused throughout all nature, and to operate in the uniting, organizing, and sustaining its various parts. Plato treats at large of the, ψυχη τε κοσμου, in his Timæus; and even is supposed to be the author of the dogma; but whether Plato derived it originally from the Egyptians, or more directly, according to the opinion of Gale, from higher and purer sources, is very doubtful. It also pervaded the systems of the earlier Indian sages, of Pythagoras, the Peripatetics, and the Stoics. Of this soul or fountain of spiritual existence, the souls of men, in particular, were held to be an emanation, subject to various transmigrations and purifications; after which it should return to its original fountain or spring-head. See the article PLATO.

ANIMA SATURNI, a white powder obtained by pouring distilled vinegar on litharge, of considerable use in enamelling.

ANIMADVERT', *v.*
ANIMADVER'TOR,
ANIMADVER'SAL,
ANIMADVER'SION,
ANIMADVER'SIVE.

Animadverto, animus, adverto. To turn the mind to; to direct the attention to, in order to form a judgment or opinion and generally; to pronounce censure.

He dismissed their commissioners with severe and sharp *animadversions*. *Clarendon.*

I wish, Sir, you would do us the favour to *animadvert* frequently upon the false taste the town is in with relation to the plays as well as operas. *Steele.*

These things fall under a province you have partly pursued already, and therefore demands your *animadversions* for the regulating so noble an entertainment as that of the stage. *Steele.*

I should not *anidmadvert* on him, who was a painful observer of the decorum of the stage, if he had not used extreme severity in his judgment of the incomparable Shakspeare. *Dryden.*

When a bill is debating in parliament, it is usual to have the controversy handled by pamphlets on both sides; without the least *animadversion* upon the authors. *Swift.*

ANIMALS.

ANIMAL, *n.* & *adj.*
ANIMAL'ITY,
AN'IMANT,
AN'IMATE, *v.* & *adj.*
ANIMA'TED,
ANIMA'TION,
ANIMA'TOR.

Lat. *animus*; Gr. *ανεμος*, spirit; to give life, breath, or spirit, both literally and metaphorically; to impart animation and vigour.

And as Job setteth the resurreccion ayenste the sorrows and pains of death, so dothe Daniel here for our consolacion sette it ayenste our persecucion whiche did so *animate* the faithfull in tymes paste, that thei refused the delyuerance from death of bodye for that lyfe and resurreccion to come.

The Exposicion of Daniel, by Joye, p. 231.

Kynge Edwarde beeyng nothyng abasshed of thys mall chaunce, sente good woordes to the Earle of Pembroke, *animatynge* and bydynge hym to be of a good courage. *Hall. Edward* iii. f. 201.

The British have a lively *animated* aspect. *Steele.*

Some would be apt to say he is a conjurer; for he has found that a republic is not made up of every body of *animals*, but is composed of men only and not of horses. *Ibid.*

——What is this world?
What but a spacious burial-field unwall'd,
Strew'd with death's spoils—the spoils of *animals*,
Savage and tame, and full of dead men's bones.
Blair.

A friend of mine, who is profoundly skilled in the theory of music, well acquainted with the *animal* economy, and singularly accurate in his inquiries into nature, assures me, that he has been once and again wrought into a feverish fit by the tones of an Æolian harp. *Beattie.*

Can storied urn or *animated* bust,
Back to its mansion call the fleeting breath?
Can honour's voice provoke the silent dust,
Or flattery sooth the dull cold ear of death?
Gray.

The celebrated Mr. Ray gives the two following tables of animals;

ANIMALS are either

- Sanguinous, that is, such as have blood; which breathe, either by
  - Lungs, having either
    - Two Ventricles in their heart, and those either
      - Viviparous, as Quadrupeds.
      - Oviparous, as birds.
    - But one Ventricle in their heart as frogs, tortoises, and serpents.
  - Gills as all sanguinous fishes, except the whale kind.
- Or Exsanguinous, that is, without blood; which may be divided into
  - Greater, and those either
    - Naked, Terrestrial, as naked snails.
    - Naked, Aquatic, as the poulp, cuttle-fish, &c.
    - Covered with a tegument.
  - Lesser, as insects of all sorts, either
    - Crustaceous, as lobsters and crab-fish.
    - Testaceous either
      - Univalve, as limpets.
      - Bivalve, as oysters, muscles, cockles.
      - Turbinate, as periwinkles, snails, &c.

Viviparous hairy ANIMALS, or *Quadrupeds*, are either.

- Hoofed, which are either
  - Whole-footed, or hoofed, as the horse and ass;
  - Or
  - Cloven-footed, having the hoof divided into either.
    - Two principal parts, called bisulca, either
      - Such as chew not the cud, as swine;
      - Or Ruminant, i. e. such as chew the cud; divided into
        - Such as have perpetual and hollow horns; as the
          - Beef kind, Sheep kind, & Goat kind.
        - And Such as have solid, branched & deciduous horns, as the deer kind.
    - Or
    - Four parts, or Quadrisulca, as the hippopotamus.
- Or
- Clawed or digitate, having the foot divided into either
  - Two parts or toes, having two nails, as the camel kind;
  - Or
  - Many toes or claws; either
    - Undivided as the elephant;
    - Or
    - Divided; which have either
      - Broad nails, and a human shape, as apes;
      - Or
      - Narrower, and more pointed nails.

In respect of their *teeth*, they are divided into

- Such as have many foreteeth, or cutters in each jaw, viz.
  - The greater, which have either
    - A shorter snout & rounder head, as the cat kind;
    - Or
    - A longer snout, as the dog kind.
  - And
  - The lesser, the vermine or weasel kind.
- And
- Such as have Only two large and remarkable foreteeth, all which are phytivorous, and are called the hare kind.

THE ANIMAL KINGDOM, Animale Regnum, of Linnæus, is one of the three principal divisions of organised nature, consisting of classes, orders, genera, and species. Animals were by him divided into six classes, namely, Mammalia, or such as suckle their young, mostly quadrupeds—Aves, birds, which are oviparous—Amphibia, amphibious creatures, living either on land or in the water—Pisces, fishes, which live only in the water, and are covered with scales—Insecta, insects, which have few or no organs of sense, and a bony coat of mail—Vermes, worms, which have mostly no feet.

THE FIRST CLASS, OR MAMMALIA,

Consist of seven orders: namely, the Primates, Bruta, Feræ, Glires, Pecora, Belluinæ, and Cetæ.

The first order, or Primates, is divided into four genera: namely, Homo, the man. Simia, the ape, the baboon, and the monkey. Lemur, the lemur. Vespertilio, the bat.

The second order, or Bruta, comprehends the following genera: namely, Bradypus, the sloth. Myrmecophaga, the ant-eater. Dasypsus, the armadillo. Rhinoceros, the rhinoceros. Sokotyro. Elephas, the elephant. Trichechus, the morse, walrus. Manis.

The third order, or Feræ, has ten genera: namely, Phoca, the seal. Canis, the dog, the wolf, the fox, and the hyæna. Felis, the lion, the tiger, the leopard, the tiger-cat, the lynx, and the cat. Viverra, the weasel, the shunk, the civet, the genet, and the fitchet. Mustela, the otter, the marten, the ferret, the polecat, the ermine, and the stoat. Ursus, the bear, the badger, the racoon, and the glutton. Didalphis, the opussum, marmose, phalanger, and the kangaroo. Talpa, the mole. Sorex, the shrew. Erinaceus, the hedge-hog.

The fourth order, or Glires, has the following genera, namely: Histrix, the porcupine. Cavia the cavy. Castor, the beaver. Mus, the rat, the musk-rat, and the mouse. Arctomys, the marmot. Sciurus, the squirrel. Myoxus, the dormouse. Dipus, the jerboa. Lepus, the hare and the rabbit. Hyrax.

The fifth order, or Pecora, has the following genera, namely, Camelus, the camel, the lama Moschus, the musk. Cervus, the stag, the deer the moose, or elk. Camelopardalis, the cameleopard or giraffe. Antilopus, the antelope. Capra the goat. Ovis, the sheep. Bos, the ox.

The sixth order, or Belluinæ, has the following genera: namely, Equus, the horse, the ass and the mule. Hippopotamus, the river-horse Tapir, the tapir. Sus, the hog.

The seventh order, or Cetæ, has the following genera: namely, Monodon, the monodon. Balæna, the whale. Physeter, the cachelot. Del

phinus, the porpoise, the dolphin, and the grampus.

The Second Class, or Aves,

Birds, is divided into six orders, namely: Accipitres, Picæ, Anseres, Grallæ, Gallinæ, Passeres.

The first order, or Accipitres, has four genera: namely, Vultur, the vulture and the condur. Falco, the eagle, the kite, the buzzard, the falcon, and the hawk. Strix, the owl. Lanius, the shrike, the butcher-bird, and the woodchat.

The second order, or Picæ, has the following genera: namely, Ramphastos, the toucan. Momotus, the motmot. Psittacus, the parrot, the maccaw, the parroquet, the cockatoo, and the lory. Scythrops. Buceros, the horn-bill. Crotophaga, the ani. Glaucopis, the wattle-bird. Corvus, the crow, the rook, the raven, the jackdaw, and the jay. Coracias, the roller. Oriolus, the oriole. Gracula, the grackle. Paradisea, the bird of Paradise. Bucco, the barbet. Trogon, the curucui. Cuculus, the cuckoo. Yunx, the wryneck. Picus, the woodpecker. Sutta, the nuthatch. Todus, the toddy. Alcedo, the kingfisher. Galbula, the jacama. Merops, the bee-eater. Upupa, the hoop or hoopo. Certhia, the creeper. Trochilus, the humming-bird. Buphuga.

The third order, or Anseres, has the following genera: namely, Anas, the swan, the goose, the duck, the shoveller, and the teal. Mergus, the merganser, the goosander, the dunn-diver, and the smew. Alca, the auk or razor-bill. Aptenodytes, the penguin. Procellaria, the petrel. Diomedea, the albatross, or man-of-war bird. Pelicanus, the pelican, the corvorant, the shag, the crane, the gannet, and the booby. Plotus, the darter. Phæton, the Tropic bird. Colymbus, the guillemot, the diver, and the grebe. Larus, the gull, and the tarrock or kittiwake. Sterna, the tern. Rynchops, the skimmer.

The fourth order, or Grallæ, has the following genera: namely, Phœnicopteros, the flamingo, Platalea, the spoon-bill. Palamedea, the screamer. Mycteria, the jabiru. Cancroma, the boat-bill. Scopus, the umbre. Ardea, the heron, the crane, the stork, and the bittern. Tantalus, the ibis. Corrira, the courier. Scolopax, the curlew, the whintrel, the snipe, the woodcock, the godwit, and the red-shank. Tringa, the sandpiper, the phalarope, and the purre. Charadrius, the plover and the dotterel. Recurvirostra, the avocet. Hæmatopus, the sea-pie or pied oyster, and the catcher. Glareola, the pratincole. Fulica, the gallinule, the moor-hen, and the coot. Vaginalis, the sheath-bill. Parra, the jacana. Rallus, the rail, the crake or sand-rail, the brook-ouzel or water-rail, and the soree. Psophia, the trumpeter.

The fifth order, or Gallinæ, has the following genera: namely, Otis, the bustard. Struthio, the ostrich, and the cassowary or emu. Didus, the dodo. Pavo, the peacock. Meleagris, the turkey. Penelope, the guam and the yacou. Crax, the curassow. Phasianus, the pheasant. Numidia, the pintado or Guinea-hen. Tetrao, the grous, the moorcock, the partridge, the quail, and the tinamou.

The sixth order, or Passeres, has the following genera: namely, Columba, the pigeon, the ring-dove, the turtle-dove, &c. Alauda, the lark. Sturnus, the stare or starling, and the crake or water-ouzel. Turdus, the thrush, the field-fare, the blackbird, and the ring-ouzel. Ampelis, the chatterer. Colius, the coly. Loxia, the grossbeak, the crossbill, and the haw-finch. Emberiza, the bunting. Tanagra, the tanajer. Fringilla, the finch, the chaffinch, the siskin, the redpole, the linnet, the twite, and the sparrow. Phytotoma, the phytotoma. Muscicapa, the fly-catcher. Motacilla, the wagtail or warbler, the nightingale, the hedge-sparrow, the wren, the white-throat, the wheat-ear, and the red-start. Pipra, the minnakin. Parus, the titmouse. Hirundo, the swallow and the swift. Caprimulgus, the goatsucker.

The Third Class, or Amphibia,

Amphibious animals, is divided into two orders: namely, Reptilia, reptiles, and serpentes, serpents.

The first order, or Reptilia, reptiles, comprehends the following genera: namely, Testudo, the tortoise and the turtle. Rana, the toad, the frog, and the natter-jack. Draco, the flying-dragon. Lacerta, the crocodile, the alligator, the lizard, the guana, the newt, the salamander, the chameleon, the eft. Siren.

The second order or Serpentes, serpents, has the following genera: namely, Crotalus, the rattle-snake. Boa. Coluber, the viper and the asp. Anguis, the snake and the blind-worm. Amphisbœna. Cœcilia. Achrocordus, the warted snake.

The Fourth Class, or Pisces,

Fishes, into six orders. namely, apodal, jugular, thoracic, abdominal, branchiostegous, chondropterigious.

The first order, or Apodal, has the following genera: namely, Muræna, the eel. Gymnotus. Trichiuris. Anarhicas, the wolf-fish. Ammodytes, the launce. Stromateus. Xiphias, the sword-fish. Sternopfyx. Leptocephalus, the morris. Stylephorus. Ophidium. Gymnothorax.

The second order, or Jugula has the following genera: namely, Callionymus, the dragonet. Uranoscopus. Trachinus, the sting-bull or weaver. Gadus, the cod-fish, the bib, the whiting, the coal-fish, the hake, the barbot, and the rockling. Blennius, the blenny. Kurtus.

The third order, or Thoracic, has the following genera, namely: Cepola. Echineis, the sucking-fish. Coryphœna. Gobius, the goby. Cottus, the bull-head, the father lasher, and the miller's thumb. Scorpœna. Zeus, the John Doree. Pleuronectes, the hollibut, the flounder, the plaise, the dab, the sole, the smear dab, the pearl, and the turbot. Chætodon. Sparus, the gilthead, the pudding-fish. Scarus. Labrus, the wrasse, the goldfinny, the camber, and the cook. Sciœna. Perca, the perch, the basse, the luffe, the black fish, and the squirrel-fish. Trachychthys. Gasterosteus, the stickleback. Scomber, the mackerel, the thunny, the scad, and the yellow-tail. Centrogater. Mullus, the surmullet.

Trigla, the gurnard, the piper, and the tub-fish. Lonchiurus.

The fourth order, or Abdominal, the following genera: namely, Cobitis, the loche and the mud-fish. Amia. Silurus. Teuthis. Salmo, the salmon, the trout, the salmon-trout or bull-trout, charr, the smelt, the gurniad, and the lavaret. Fistularia, the tobacco-pipe-fish. Esox, the pike and the garfish. Elops. Argentina, the argentine. Atherina, the atherine or silver-fish. Mugil, the mullet. Excocoetus, the flying-fish. Polynemus. Clupea, the herring, the pilchard, the sprat, the shad, and the anchovy. Cyprinus, the carp, the barbel, the gudgeon, the tench, the crucian, the gold-fish, the dace, the roach, the finscale or rud, the red eye, the bleak, the brear, the minnow, and the graining. Loncaria.

The fifth order, or Branchiostegous, the following genera: namely, Mormyrus. Ostracion. Tetrodor, the sun-fish. Diodon. Singnathus, the pipe-fish and the needle-fish. Pegasus. Centriscus. Balistes. Cyclopterus, the sucker. Lophius, the fishing-frog, and the angler or frog-fish.

The sixth order, or Chondropterigious has the following genera: namely, Acipenser, the sturgeon. Chimæra, the sea-monster. Squalus, the shark, the dog-fish, the tope, the sea-fox, and the angel-fish. Pristis, the saw-fish. Raia, the ray, the skate, the thornback. Petromyzon, the lamprey, and the pride. Gastrobranchus, the hag or hag-fish.

The Fifth Class, or Insecta,

Insects, is divided into seven orders: namely, Coleoptera, hemiptera, lepidoptera, neuroptera, hymenoptera, diptera, and aptera.

The first order, or Coleoptera, contains the following genera: namely, Scarabæus, the beetle. Lucanus. Dermestes, the leather-eater. Synodendron. Bostrichus. Melyris. Ptinus, the death-watch. Hister. Gyrinus, the water-flea. Byrrhus. Anthrenus. Silpha, the carrion beetle. Nitidula. Opatrum. Titroma. Tetratoma. Cassida. Coccinella. Chrysomela. Cryptocephalus. Hispa. Bruchus. Pausus. Zygia. Zonitis. Apalus. Brentus. Curculio. Rhinomacer. Attelabus. Notoxus. Cerambyx. Calopus. Leptura. Necydalis. Lampyris, the fire-fly. Horia. Cucujus. Cantharis. Serropalpus. Elater. Cucindela. Bupestris. Hydrophilus, the water-clock. Dytiscus. Carabus. Tenebrio. Pimelia. Lytta. Meloe. Mordella. Staphylinus. Forficula, the ear-wig. Erodius. Manticora. Alurnus.

The second order, or Hemiptera, has the following genera: namely, Blatta, the cockroach. Pneumora. Mantis. Gryllus, the locust, the grasshopper, and the cricket. Fulgora, the lanthorn-fly. Cicada. Notonecta, the boat-fly. Nepa, the water-scorpion. Cimex, the bug. Macrocephalus. Aphis, the plant-louse. Chermes. Coccus, the cochineal. Thrips.

The third order, or Lepidoptera, the following genera: namely, Papilio, the butterfly. Sphinx, the hawkmoth. Phalæna, the moth.

The fourth order, or Neuroptera, the following genera: namely, Libellula, the dragon-fly. Ephemera, the day-fly. Phryganea. Hemerobius Myrmeleon, the lion-ant. Panorpa. Raphidia

The fifth order, or Hymenoptera, has the following genera: namely, Cynips, the gall-fly Tenthredo, the saw-fly. Sirex, the tailed wasp Ichneumon, the ichneumon. Sphex. Ammophila. Scolia. Thynnus. Lucopsis. Tiphia. Chalcis. Chrysis, the golden fly. Vespa, the wasp. Apis, the Bee. Formica, the Ant or Emmet. Mutilla.

The sixth order, or Diptera, has the following genera: namely, Œstrus, the gad-fly and the breeze. Tipula, the crane-fly. Diopsis. Musca, the fly. Tabanus. Culex, the gnat. Empis. Stomoxys. Conops. Asilus. Bombylius, the humble-bee. Hippobosca.

The seventh order, or Aptera, the following genera: namely, Lepisma. Podura, the spring-tail. Termes, the white ant. Pediculus, the louse and crab-louse. Acarus, the tick, the harvest-bug, and the itch-mite. Phalangium. Aranea, the Spider. Scorpio, the scorpion. Cancer, the crab, the lobster, the prawn, the shrimp, and the squill. Monoculus. Oniscus. Scolopendra. Julus. Pulex, the flea. Hydrachna.

The Sixth Class, or Vermes,

is divided into five orders: namely, Intestina, Mollusca, Testacea, Zoophyta, and Infusoria.

The first order, or Intestina, has the following genera: namely, Ascaris. Trichocephalus. Filaria. Scolex. Ligula. Strongylus. Echinorynchus. Cucullanus. Caryophyllæus. Linguatula. Fasciola, the gourd-worm or fluke. Tænia, the tape-worm. Furia. Godius, the hair-worm. Lumbricus, the earth-worm, the dew-worm, and the lug. Planaria. Sipunculus, the tube-worm. Hirudo, the leech. Uncinaria. Hæmica.

The second order, or Mollusca, has the following genera: namely, Limax, the slug or snail. Onchidium. Laplisia, the sea-hare. Doris, the sea-lemon. Aphrodita. Spio. Amphitrite. Terebella. Nereis. Nais. Ascidia. Salpa. Dagysa. Clava. Actinia, the sea-daisy, the sea-marigold, and the sea-carnation. Mammaria. Pedicillaria. Tethys. Plerotrachea. Derris. Holothuria. Lobaria. Triton. Lernæa. Scyllæa. Clio. Sepia, the cuttle-fish. Lucernaria. Medusa, the sea-nettle. Physsophora. Asterias, the star-fish and the sea-star. Echinus, the sea-urchin.

The third order, or Testacea, Shells, the following genera: namely, Chiton. Lepas, the acorn-shell. Phloas. Mya. Solen, the razor-sheath. Tellina. Cardium, the cockle. Mactra. Donax. Venus. Spondylus. Chama. Arca, the ark. Ostrea, the oyster. Anomia. Mytilus, the mussel. Pinna. Argonauta. Nautilus. Conus, the cone. Cypræa, the cowrie or gourie. Bulla. Voluta, the mitre or volute. Buccinum, the whelk. Strombus. Murex. Trochus. Turbo, the wreath. Helix, the snail. Nerita, the nerite. Haliotis, the sea-ear. Patella, the limpet. Dentalium, the tooth-shell. Serpula. Teredo. Sabella.

The fourth order, or Zoophyta, has the following genera: namely, Tubipora, the tubipore. Ma-

drepora, the madripore. Millepora, the Millepore. Cellepora, the cellepore. Isis, the coral. Antipathes. Gorgonia, the red coral. Alcyonium. Spongia, the sponge. Flustra, the hornwrack. Tubularia. Corallina, the coralline. Sertularia. Pennatula, the sea-pen. Hydra, the Polype.

The fifth order, or Infusoria, the following genera: namely, Branchionus. Vorticella. Trichoda. Cercaria. Bursaria. Gonium. Colpoda. Paramecium. Cyclidium. Vibrio. Bacillaria. Enchelis. Volvox. Monas. Leucopera.

Animal Flower, in zoology, a name given to several species of animals belonging to the genus Actinia of Linnæus. They have likewise been distinguished by the names of urtica marina, or sea-nettle, from their supposed property of stinging; and sea-anemone, from their claws or tentacles being disposed in regular circles, and tinged with a variety of bright lively colours, resembling the petals of some of our most beautiful flowers: as to one species particularly, mentioned by Abbe Dicquemarre, in the Philosophical Transactions for 1737, Art. 37, the purest white, carmine, and ultramarine are said to be scarcely sufficient to express their brilliancy. The bodies of some of them are hemispherical, of others cylindrical, and of others shaped like a fig. Their substance likewise differs; some are stiff and gelatinous, others fleshy and muscular; but all of them are capable of altering their figure when they extend their bodies and claws in search of food. They are found in many of the rocky coasts of the West India Islands, and likewise on some parts of the coast of England. They have only one opening, which is in the centre of the uppermost part of the animal; round this are placed rows of fleshy claws; this opening is the mouth of the animal, and is capable of great extension. The animals themselves, though exceedingly voracious, will bear long fasting. They may be preserved alive a whole year, or perhaps longer, in a vessel of sea-water, without any visible food; but when food is presented one of them will successively devour two muscles in their shells, or even swallow a whole crab as large as a hen's egg. In a day or two the crab-shell is voided at the mouth, perfectly cleared of all the meat. The muscle shells are likewise discharged whole, with the two shells joined together, but entirely empty, so that not the least particle of fish is to be perceived on opening them. An anemone of one species will even swallow an individual of another species; but after retaining it ten or twelve hours will throw it up alive and uninjured. Through this opening also it produces its young ones alive, already furnished with little claws, which, as soon as they fix themselves, they begin to extend in search of food. One of the extremities of the sea-anemone resembles the outward leaves of that flower; while its limbs are not unlike the shag or inner part of it. By the other extremity it fixes itself, as by a sucker, to the rocks or stones lying in the sand; but it is not totally deprived of the power of progressive motion as it can shift its situation, though very slowly.

In Hughes's Natural History of Barbadoes is an account of a remarkable species. 'In the middle of the basin [of a cave] there is a fixed stone or rock which is always under water. Round its sides, at different depths, seldom exceeding eighteen inches, are seen at all times of the year issuing out of little holes certain substances that have the appearance of fine radiated flowers, of a pale yellow or a bright straw-colour, slightly tinged with green, having a circular border of thick set petals, about the size of, and much resembling, those of a single garden marigold, except that the whole of this seeming flower is narrower at the discus, or setting on of the leaves, than any flower of that kind. I have attempted to pluck one of these from the rock, to which they are always fixed, but never could effect it; for, as soon as my fingers came within two or three inches of it, it would immediately contract close together its yellow border and shrink back into the hole of the rock; but if left undisturbed for about four minutes it would come gradually in sight, expanding, though at first very cautiously, its seeming leaves, till at last it appeared in its former bloom. However it would again recoil with a surprising quickness when my hand came within a small distance of it. Having tried the same experiment by attempting to touch it with my cane and a small slender rod the effect was the same. Though I could not by any means contrive to take or pluck from the rock one of these animals entire, yet I once cut off (with a knife which I had held for a long time out of sight, near the mouth of a hole out of which one of these animals appeared) two of these seeming leaves. These, when out of the water, retained their shape and colour; but being composed of a membrane-like substance, surprisingly thin, it soon shrivelled up and decayed.

In the Philosophical Transactions, vol. lvii. is a letter by Mr. Ellis to the late lord Hillsborough, describing another species. 'This compound animal, which is of a tender fleshy substance, consists of many tubular bodies, swelling gently towards the upper part, and ending like a bulb or very small onion; on the top of each is its mouth, surrounded by one or two rows of tentacles or claws, which when contracted look like circles of beads. The lower part of all these bodies have a communication with a firm, fleshy, wrinkled, tube, which sticks fast to the rocks and sends forth other fleshy tubes which creep along them in various directions. These are full of different sizes of these remarkable animals, which rise up irregularly in groups near to one another. This adhering tube, that secures them fast to the rock or shelly bottom, is worthy of our notice. The knobs that we observe, are formed in several parts of it by its insinuating itself into the inequalities of the coral-rock or by grasping pieces of shells, parts of which still remain in it with the fleshy substance grown over them. This shows us the instinct of nature, that directs these animals to preserve themselves from the violence of the waves, not unlike the anchoring of muscles, by their fine silken filaments that end in suckers; or rather like the shelly basis of the serpula, or worm shell,

the tree-oyster, and the slipper-barnacle, &c. whose bases conform to the shape of whatever substance they fix themselves too, grasping it fast with their testaceous claws to withstand the fury of a storm. When we view the inside of this animal dissected lengthwise, we find like a little tube leading from the mouth to the stomach, from whence rise eight wrinkled small guts, in a circular order, with a yellowish soft substance in them; these bend over in the form of arches towards the lower part of the bulb, from whence they may be traced downwards to the narrow part of the upright tube till they come to the fleshy adhering tube, where some of them may be perceived entering into a papilla, or the beginning of an animal of the like kind, most probably to convey it nourishment till it is provided with claws: the remaining part of these slender guts are continued on in the fleshy tube, without doubt for the same purpose of producing and supporting more young ones from the same common parent. The many longitudinal fibres that we discover lying parallel to each other on the inside of the semi-transparent skin, are all inserted in the several claws round the animal's mouth, and are plainly the tendons of the muscles for moving and directing the claws at the will of the animal: these may be likewise traced down to the adhering tube. As this specimen has been preserved in spirits, the colour of the animal when living cannot be certainly known; it is at present of a pale yellowish brown. With regard to its name, it may be called actinia sociata, or the cluster animal-flower.'

The Abbe Dicquemarre, by many curious though cruel experiments, related in the Philosophical Transactions for 1773, has shown, that these animals possess, in a most extraordinary degree, the power of reproduction; so that scarcely any thing more is necessary to produce as many sea anemonies as we please than to cut a single one into as many pieces. A sea anemone being cut in two by a section through the body, that part where the limbs and mouth are placed ate a piece of a muscle offered to it soon after the operation, and continued to feed and grow daily for three months after. The food sometimes passed through the animal; but was generally thrown up again, considerably changed, as in the perfect sea-anemone. In about two months two rows of limbs were perceived growing out of the part where the incision was made. On offering food to this new mouth, it was laid hold of and eat; and the limbs continually increasing, the animal gradually became as perfect as those which had never been cut. In some instances, however, he found, that when one of these creatures was cut through, new limbs would be produced from the cut place, those at the mouth remaining as before; so that a monstrous animal was the consequence, having two mouths, and feeding at both ends. Having put some of them into a pan of water set over a slow fire, he found that they lost their life at fifty degrees of Reaumur's thermometer. To avoid the imputation of cruelty in these experiments, the author argues the favourable consequences that have attended his operations on the sea-anemonies, which have been so fortunate as to fall into his hands: as he hath not only multiplied their existence, but also renewed their youth; which last, he adds, 'is surely no small advantage.' The reproductive power of the Barbadoes animal flower is prodigious. Many people coming to see these strange creatures, and occasioning some inconvenience to a person through whose ground they were obliged to pass, he resolved to destroy the objects of their curiosity; and, that he might do so effectually, caused all the holes out of which they appeared, to be carefully bored and drilled with an iron instrument, so that we cannot suppose but their bodies must have been entirely crushed to a pulp: nevertheless, they again appeared in a few weeks from the very same places.

Animal Strength. The strength of men and horses, is very frequently employed as a first mover of machinery, and hence the subject of animal power and its effects become a collateral branch of mechanics, which is very interesting and important. But animal strength being less uniform in its operation than weights or water as moving powers, is necessarily more difficult to estimate according to determinate laws; yet even here a careful examination of the principal modes in which animals are employed, with a comparison of certain experiments made under various circumstances by different authors, will enable us to lay down some rules and principles important to engineers and other practical men. Investigations purely analytical are of little use in such cases; we select therefore a few of the best-conducted experiments that have been made with reference to this subject.

According to Desaguliers a man can raise water, or any other weight, about 550 lbs. (or one hogshead, the weight of the vessel included) ten feet high in a minute; but this statement, although he says it will hold good for six hours, appears from his own facts to be too high, and is certainly such as could not be continued one day after another. Mr. Smeaton considers this work as the effort of haste or distress; and reports that six good English labourers will be required to raise 21,141 solid feet of sea-water to the height of four feet in four hours; in which case the men would raise very little more than six cubic feet of fresh water each to the height of ten feet in a minute. Now the hogshead containing about 8½ cubic feet, Smeaton's allowance of work proves less than Desaguliers' in about the ratio of 6 to 8½. And his good English labourers, who can work at this rate, are estimated by him to be equal to a double set of common workmen; it appears, therefore, that with the probabilities of voluntary interruptions and other incidents, a man's work for several successive days ought not to be valued at more than half a hogshead raised ten feet high in a minute. Mr. Smeaton also states that two ordinary horses will do the above work in 3½ hours, which is at the rate of little more than 2½ hogsheads ten feet high in a minute; so that if these statements can be depended upon, one horse will do the work of five men.

Emerson contends that a man of ordinary strength turning a roller by the handle, can act for a whole day against a resistance equal to 30 lbs.

weight; and if he work ten hours per day, he will raise a weight of 30 lbs. through 3½ feet in a second of time; or, if the weight be greater, he will raise it to a proportional less height; so that, under all circumstances, $30 \times 3\frac{1}{2} = 105$, the momentum of his effort. If two men work at a windlass or roller they can more easily raise up 70 lbs. than one man can 30 lbs., provided the elbow of one of the handles be at right angles to that of the other. Men accustomed to bear loads, such as porters, will carry from 150 lbs. to 200 lbs. or 250 lbs., according to their strength. A man cannot well draw more than 70 lbs. or 80 lbs. horizontally; and he cannot thrust with a greater force acting horizontally at the height of his shoulders than 27 lbs. or 30 lbs. But one of the most advantageous ways in which a man can exert his force is to sit and pull towards him, as in rowing.

That accurate experimental philosopher, M. Coulumb, in a memoir communicated to the French Institute, states that the quantity of action which a man can produce, when during a day he is employed in mounting a flight of steps without a burden, is double that which the same man could produce if loaded with a weight of 223 lbs., continuing his exertions in both cases through the day. Hence it appears how much, with equal fatigue and time, the total or absolute effect may obtain different values, by varying the combination of effort and velocity. It will of course be observed by the reader that the term effect here denotes the total quantity of labour necessary to raise not only the burden but the man himself; the useful effect is very different, and it is this, as M. Coulumb observes, which it is most important to determine. For instance, we have seen that the total effect is the greatest when without a burden, but the useful effect is then nothing; it is also nothing when the man is so loaded as not to be able to move; and it is between these limits that the useful effect is a maximum; this we have already determined analytically in the foregoing part of this article, but the above results of Coulumb will be found to change somewhat of the ultimate value; the principle, however, remains, and other experiments are perhaps still necessary to arrive at a satisfactory conclusion. From an examination of the work of men walking on a horizontal path, with or without a load, the same author concludes that the greatest quantity of action takes place when the men are unloaded; and it is to that of men loaded with 190 lbs. nearly as seven to four. The weight which a man ought to carry to produce the greatest useful effect, or that effect in which the quantity of action relative to the carrying his own weight is deducted from the total effect, is 165 lbs.

A particular case should be noticed which obtains with respect to burdens carried in towns; where the men, after having carried their load, return home unloaded. The weight they ought to carry in this case, according to M. Coulumb, is about 200 lbs. Here the quantity of useful action, compared with that of a man who walks freely, and without a load, is nearly as one to five; or, in other words, he employs to pure loss four-fifths of his power. By causing a man to mount a flight of steps freely and without a burden, his quantity of action is at least double of what he affords in any other way of employing his strength. This seems to be understood by our coal-merchants, who thus employ manual labour in emptying the coal vessels of their loads in the river Thames, where we frequently see four or five men perpetually ascending a step-ladder and jumping down, so as by their weight to bring up the coals from the hold by means of a rope passing over a pulley. Here the useless action is in ascending, and the useful in descending.

When labour is applied to cultivating the ground, the whole quantity afforded by one man during a day amounts to about the same as 328 lbs. raised 1094 yards; and M. Coulumb comparing this work with that of men employed to carry burdens up an ascent of steps, or at a pile-engine, finds a loss of about $\frac{1}{30}$th part only of the quantity of action, which may be neglected in researches of this kind. In estimating these and other mean results, we should not determine from experiments of short duration, nor should we make any deductions from the exertions of men of more than ordinary strength. The mean results have also a relation to climate. M. Coulumb observes, that he has directed extensive works at Martinico where Fahrenheit's thermometer is seldom less than 77°, and similar works in France; and he affirms that not more than half the work can be done in similar cases in the one climate to what can be effected in the other.

Amongst quadrupeds, the most useful, as a first mover of machinery, is the horse. The strength of this animal is, perhaps, about six times that of a man. Desaguliers states the proportion as five to one, coinciding with our preceding deductions from Smeaton's results. French authors commonly reckon seven men as equivalent to one horse, and probably, upon the whole, one to six may be stated as a fair proportion; the strength of a man, at a dead pull, being therefore estimated at 70 lbs.; that of a horse, under like circumstances, will be 420 lbs. The fact is, however, that it is very difficult to make a comparison between two animals whose powers are so differently exerted. The worst way of applying the strength of a horse is to make him carry a weight up a steep hill, while the organisation of man fits him very well for this kind of labour. Hence, three men climbing up such a hill, with the weight of 100 lbs. each, will proceed faster than a horse with a load of 300 lbs., as was first stated, we believe, by La Hire.

We are not acquainted with any series of experiments which have been made with a view of determining the weights horses can carry, when moving up sloping roads, making given angles with the horizon; but, fortunately, this deficiency is not of much consequence, because, as we have stated, the carrying of weights is far from the best manner of employing the strength of these animals. It is known however, in general, that a horse loaded with a man and his equipage, weighing at a medium about 224 lbs., may without being much forced, travel in seven or eight hours the distance of 43,000 yards, or

about 25 miles, on a good road. When a horse travels day after day without cessation, either the weight he carries, or the distance passed over, must undergo some diminution, as well as the time actually employed in travelling; but we cannot undertake to assign a mean value of his capabilities.

M. Amontons, in the Memoirs of the French Academy for 1703, has given some comparative observations on the velocity of men and horses; in which he states the velocity of a horse loaded with a man, and walking, to be rather more than 5¼ feet per second, or 3½ miles per hour; and when going a moderate trot with the same weight, to be about 8½ feet per second, or 6 miles per hour. These velocites are however, we think, rather less than might have been safely assumed in these cases.

The most advantageous manner of applying the strength of man is most unfavourable for a horse; and so it is found that the most disadvantageous to the former will be the most favourable for the latter, that is, when they are employed in drawing loads in carriages. A horse put into harness, and making an effort to draw, bends himself forwards, inclines his legs, and brings his breast nearer to the earth, and this so much the more, as his effort is more considerable; so that when he is employed in drawing, his effort will depend, in some measure, both on his own weight and that which he carries on his back. Indeed, it is highly useful to load the back of a draught horse to a certain degree, though this, on a slight consideration, might be thought unnecessarily to augment the fatigue of the animal; but it must be considered, that the mass with which the horse is charged vertically, is in part added to the effort which he makes in the direction of traction, and thus dispenses with the necessity of his inclining so much forward as he must otherwise do, and may therefore, in this point of view, relieve the draught more than to compensate for the additional fatigue occasioned by the vertical pressure. Carmen and wagoners in general are aware of this, and are commonly very careful to dispose of the load in such a manner that the shafts shall throw a due proportion of the weight on the back of the shaft-horse.

The best disposition of the traces during the time a horse is drawing is when they are perpendicular to the position of the collar upon his breast and shoulders. When the horse stands at his ease, this position of the traces is rather inclined upwards, from the direction of the road; but when he leans forward to draw the load, the traces should then become nearly parallel to the plane over which the carriage is to be drawn; or, if he be employed in drawing a sledge, or any thing without wheels, the inclination of the traces with the road, supposing it to be horizontal, should be about 18½°; and even when wheels are employed, as we cannot conceive friction to be wholly destroyed, it is obvious that a slight inclination from the parallel position of the traces upwards would be rather advantageous than the contrary; although it is difficult, if not impossible, to estimate the degree of that inclination. What we have said above is with reference only to one horse; when several are harnessed together in a line so as all to draw at the same load, and the slope on which they are drawing changes, we must resolve the line of direction of each horse into two others, the one parallel and the other perpendicular to the plane of the carriage, and thus estimate the ultimate result. *Gregory's Mechanics*, vol. ii.

We may here observe, that when a horse is made to move in a circular path, as is often practised in mills and other machines, it is requisite to give to the circle which the animal has to walk round, the greatest diameter that is consistent with the local and other conditions to which the motion must be subjected. It is obvious, indeed, that since a rectilinear motion is the most easy for the horse, the less the line in which he moves is curved the greater will be the ease with which he will effect his purpose. Experiment has shown, that in the cases to which we have above alluded, although a horse may draw in a circle of eighteen feet diameter, it will be much better if the diameter be extended to twenty-five or thirty feet, and even forty feet diameter would be preferable to either of the former.

Desaguliers, in the first volume of his Experimental Philosophy, states that a horse employed daily in drawing nearly horizontal, can move, during eight hours in the day, about 200 lbs., at the rate of about 2½ miles an hour, or 3¾ feet per second. If the weight be augmented to about 240 lbs., or 250 lbs., the horse cannot move more than six hours in the day, and that with less velocity. And, in both cases, if he carry some weight, he will draw better than if he carried none. Sauveur estimates the mean effort of a horse at 175 lbs. French, or 189 lbs. English avoirdupois, with a velocity of rather more than two feet per second. But these are all probably too high to be continued for eight hours. In another place Desaguliers states the mean work of a horse as equivalent to raising a hogshead of water fifty feet high in a minute. But Smeaton, who examined every circumstance connected with his profession with great accuracy, reduces this effect to a height of forty feet. And by certain experiments, made before the Society for the Encouragement of Arts, it was concluded that a horse moving with a velocity of three miles per hour, can continue to exert a force of 80 lbs. But these experiments have not been detailed at sufficient length to give much satisfactory information on the subject. Indeed, it is an investigation extremely difficult to carry on with mathematical accuracy; much depends upon the size, strength, and condition of the horse, the opinion of the person making the experiment, as to what the animal is capable of performing, the time that he may be employed, &c., so that little correct information is perhaps to be expected on this point; but with regard to the mechanical advantage or disadvantage of the direction in which his power is applied, this is a subject which comes fairly within the province of mechanics, and may be determined with all the precision appertaining to that branch of science.

We subjoin a few feats of animal strength, natural or artificial. Extraordinary powers, whether natural or artificial, cannot but be cu-

sidered as an interesting subject for philosophical reflection; amongst the best authenticated are those recorded by Desaguliers, of Thomas Topham, a man, at the time he exhibited before the author, thirty-one years of age, but who had practised the same feats for five or six years preceding that time. The exploits of this man, which were witnessed by Desaguliers, were as follow:

1. 'By the strength of the fingers (only rubbed in cold ashes to keep them from slipping) he rolled up a very large pewter dish.

2. 'He broke seven or eight short and strong pieces of tobacco-pipe with the force of his *middle* finger, having laid them on the first and third finger.

3. 'Having thrust in under his garter the *bowl* of a strong tobacco-pipe, his legs being bent, he broke it to pieces by the tendons of his hams without altering the bending of his legs.

4. 'He broke such another bowl between his first and second finger, by pressing his fingers together sideways.

5. 'He lifted a table six feet long, which had half a hundred weight hanging at the end of it, with his teeth, and held it in a horizontal position for a considerable time. It is true the feet of the table rested against his knees; but, as the *length* of the table was much greater than its height, that performance required a great strength to be exerted by the muscles of his loins, those of his neck, the *masseter*, and *temporal* (muscles of the jaws), besides a good set of teeth.

6. 'He took an iron kitchen poker, about a yard long and three inches in circumference, and, holding it in his right hand, he struck upon his bare left arm, between the elbow and the wrist, till he bent the poker nearly to a right angle.

7. 'He took such another poker, and holding the ends of it in his hands, and the middle against the back of his neck, he brought the two ends of it together before him; and, what was yet more difficult, he pulled it almost straight again: because the muscles which separate the arms horizontally from each other are not so strong as those that bring them together.

8. 'He broke a rope of about two inches in circumference, which was in part wound about a cylinder of five inches in diameter, having fastened the other end of it to straps that went over his shoulders. But he exerted more force to do this than any other of his feats, from his awkwardness in going about it: for the rope yielded and stretched as he stood upon the cylinder, so that when the extensors of the legs and thighs had done their office in bringing his legs and thighs straight, he was forced to raise his heels from their bearing, and use other muscles that were weaker. But, if the rope had been so fixed that the part of it to be broken had been short, it would have been broken with four times less difficulty.

9. 'I have seen him lift a rolling-stone of about 800 lbs. with his hands only, standing in a frame above it, and taking hold of a chain that was fastened to it. By this I reckon, he may be almost as strong again as those who are commonly considered as very strong men.'—*Desaguliers's Experimental Philosophy.*

ANIMALAYA, or hill of elephants (so called from the abundance of these animals in the neighbourhood), a town in the district of Coimbetoor, Hindostan, on the west side of the river Ulime; eighteen miles from Coimbetoor, and twenty from Pelicaudcherry. Dr. Buchanan describes it as containing about 200 houses; having extensive forests of teak and other useful timbers in the neighbourhood, where the elephants are on the increase, little attention having been paid to these woods of late years. The Ulime is an insignificant stream, and no other water carriage for the transportation of timber is near. There is a modern fort at a short distance westward of the town, and standing opposite a pass between the mountains that run north from Cape Comorin and the Ghauts of Carnata; this is the great thoroughfare between Malabar and the southern parts of Arcot.

ANIMALCULE. The word in general signifies a little animal; and thus the term might be applied to every animal which is considerably inferior in size to ourselves. It has been customary, however, to distinguish by the name of animalcules only such animals as are of a size so diminutive, that their true figure cannot be discerned without the assistance of glasses; and more especially it is applied to such as are altogether invisible to the naked eye, and cannot even be perceived to exist but by the assistance of microscopes. By the help of magnifying glasses we are brought into a kind of new world; and numberless animals are discovered, which from their minuteness must otherwise for ever have escaped our observation: and how many kinds of these invisibles there may be, is still unknown; as they are discerned of all sizes, from those which are barely invisible to the naked eye, to such as resist the action of the microscope, as the fixed stars do that of the telescope, and with the best magnifiers hitherto invented appear only as so many moving points. The smallest living creatures our instruments can show are those that inhabit the waters; for though possibly animalcules equally minute, or perhaps more so, may fly in the air, or creep upon the earth, it is scarce possible to bring such under our examination; but, water being transparent, and confining the creatures in it, we are able, by applying a drop of it to our glasses, to discover, to a certain degree of smallness, all that it contains. Some of the most curious of these animalcules, which have been described by microscopical observers, we shall here mention.

When paste is allowed to stand till it becomes sour, it is then found to be the habitation of numberless animalcules, like eels, which may be discerned by the naked eye; and though their form cannot be perfectly distinguished, their motion is very perceptible, and the whole paste will seem to be animated

The most remarkable property of these insects is, that they are viviparous. If one of them is cut through near the middle, several oval bodies of different sizes will be seen to issue forth. These are young anguillæ, each of them coiled up and enclosed in its proper membrane, which is so exquisitely fine, as scarcely to be discernible by the greatest magnifier, while it encloses the embryo animal. The largest and most forward immediately break through this covering, unfold themselves, aud wriggle about in the water nimbly; others get out, uncoil, and move themselves about more slowly; and the least mature continue entirely without motion. The uterus, or vessel that contains all these oval bodies, is composed of many ringlets, not unlike the aspera arteria of land animals, and seems to be considerably elastic; for as soon as the animalcule is cut in two, the oval bodies are thrust out with some degree of violence, from the springing back or action of this bowel. Upwards of 100 young ones have been seen to issue from the body of one single eel, whereby the prodigious increase of them may be accounted for; as probably several such numerous generations are produced in a short time. They seem to be all prolific; and unless the trial happens to be made upon one that has brought forth all its young, or when the paste has been kept for a very long time, the experiment will always succeed.—This property of these eels being viviparous renders it highly improbable that they ever become flies. Animalcules of a similar kind are likewise found in vinegar; and, like those already described, are found to be viviparous.

It is not only in acids that animalcules are seen. In some fields of wheat, many grains may be observed that appear blackish outwardly, as if scorched; but, when opened, are found to contain a soft white substance, which attentively considered, appears to be nothing else than a congeries of threads or fibres lying close to each other in a parallel direction, much resembling the unripe down of some thistles on cutting open the flower-heads before they begin to blow. This fibrous matter discovers not the least sign of life or motion, unless water is applied; but immediately on wetting, provided the grains of wheat have been newly gathered, the supposed fibres separate, and appear to be living creatures. Their motions at first are very languid; but gradually become more vigorous, twisting and wriggling themselves somewhat in the manner of the eels in paste, but always slower than they, and with a great deal of regularity. If the grains of wheat are grown dry by keeping, and in that condition are cut open, the fibrous matter is very distinguishable; and, on putting water to it, will separate with great readiness, and seem like fine tubes or threads tapering at both ends; but not the least motion will be perceived till they have been in water for several hours, and sometimes they will never move at all. But if the same grains are steeped in water for three or four hours, or buried for some days in the earth till they are fully saturated with moisture, and then opened with a penknive; on taking out a small portion of the white matter carefully, and spreading it thin upon a slip of glass, the animalcules will be seen bundled together, and extended longitudinally but without motion; and though, upon the application of water, they will not revive so soon as those taken from fresh grains whose moisture has never been exhaled; yet, after remaining an hour or two in the water, they are constantly found alive and vigorous, even though the grains have been kept in a dry condition for several years. It is necessary, however, to adapt in some measure the time of continuing the grains in water or earth to the age and dryness of them; for if they are not opened before they are too much softened, the animalcules will be dead; and unless the husks are opened to let those creatures out after they have been steeped, they inevitably perish in them: otherwise they will continue alive in water for many months; and, should the water dry away, may be revived again by giving them a fresh supply.

Animalcules of Infusion, animalcula infusoria, take their name from being found in all kinds either of vegetable or animal infusions. Indeed, there is scarce any kind of water, unless impregnated with some mineral substance, but what will discover living creatures. M. Lewenhock says, that at first he could discern no living creatures in rain-water; but, after standing some days, he discovered innumerable animalcules, many thousands of times less than a grain of sand, and in proportion to a mite as a bee is to a horse. In other rain-water, which had likewise stood some time, he found the smallest sort he had ever seen; and, in a few days more, met with others eight times as big as these, and almost round. In another quantity of rain-water, that had been exposed like the former, he discovered a kind of animalcules with two little horns in continual motion. The space between the horns was flat, though the body was roundish, but tapering a little towards the end; where a tail appeared four times as long as the body, and the thickness of a spider's web. He observed several hundreds of these within the space a grain of sand would occupy. If they happened on the least filament or string, they were entangled in it; and then would extend their bodies into an oblong round, and struggle hard to disengage their tails. He observed a second sort of an oval figure, and imagined the head to stand at the sharpest end. The body was flat, with several small feet moving exceeding quick, but not discernible without a great deal of attention. Sometimes they changed their shape into a perfect round, especially when the water began to dry away. He met also with a third sort, twice as long as broad, and eight times smaller than the first; yet in these he discerned little feet, whereby they moved very nimbly. He perceived likewise a fourth sort, a thousand times smaller than a louse's eye, and which exceeded all the rest in briskness; he found these turning themselves round, as it were, upon a point, with the celerity of a top; and he says there were several other sorts. The production of animalcula infusoria is very surprising. In four hours' time, an infusion of cantharides has produced animalcula less than even the tails of the spermatic

animals described in the next section. Neither do they seem to be subject to the fate of other animals; but several kinds of them at least, by dividing themselves in two, enjoy a sort of immortality. Nor do the common methods, by which other animals are destroyed, seem to be effectual for destroying their vital principle. Hot mutton gravy, secured in a phial with a cork, and afterwards set among hot ashes to destroy, as effectually as possible, every living creature that could be supposed to exist in it, has nevertheless been found swarming with animalcules after standing a few days. In the Philosophical Transactions, vol. lix. we have the following curious account, given us by Mr. Ellis, of animalcules produced from an infusion of potatoes and of hempseed: 'On the 25th of May, 1768, Fahrenheit's thermometer seventy degrees, I boiled a potatoe in the New River water till it was reduced to a mealy consistence. I put part of it, with an equal proportion of the boiling liquor, into a cylindrical glass vessel that held something less than half a wine pint, and covered it close immediately with a glass cover. At the same time I sliced an unboiled potatoe, and, as near as I could judge, put the same quantity into a glass vessel of the same kind, with the same proportion of New River water not boiled, and covered it with a glass cover, and placed both vessels close to each other. On the twenty-sixth of May, twenty-four hours afterwards, I examined a small drop of each by the first magnifier of Wilson's microscope, whose focal distance is reckoned at one-fiftieth part of an inch; and, to my amazement, they were both full of animalcules of a linear shape, very distinguishable, moving to and fro with great celerity; so that there appeared to be more particles of animal than vegetable life in each drop. This experiment I have repeatedly tried, and always found it to succeed in proportion to the heat of the circumambient air; so that even in winter, if the liquors are kept properly warm, at least in two or three days the experiment will succeed. What I have observed are infinitely smaller than spermatic animals, and of a very different shape; the truth of which every accurate observer will soon be convinced of, whose curiosity may lead him to compare them, and I am persuaded he will find them no way akin. At present I shall pass over many curious observations which I have made on two years' experiments, in order to proceed to the explaining a hint which I received last January from M. de Saussure, of Geneva, when he was here; which is, that he found one kind of these animalcula infusoria that increase by dividing across into nearly two equal parts. I had often seen this appearance in various species a year or two ago, as I found upon looking over the minutes I had taken when I made any new observation; but always supposed the animal, when in this state, to be in coition. Not hearing, till after M. de Saussure left this kingdom, from what infusion he had made his observations, his friend Dr. de la Roche of Geneva informed me, the latter end of February last, that it was from hempseed. I immediately procured hempseed from different seedsmen in different parts of the town. Some of it I put into New River water, some into distilled water, and some I put into very hard pump-water. The result was, that in proportion to the heat of the weather, or the warmth in which they were kept, there was an appearance of millions of minute animalcules in all the infusions; and sometime after, some oval ones made their appearance. These were much larger than the first, which still continued; these wriggled to and fro in an undulatory motion, turning themselves round very quick all the time that they moved forwards. I was very attentive to see these animals divide themselves; and at last I perceived a few as represented by the first magnifier of Wilson's microscope; but I am so well convinced by experience that they would separate, that I did not wait to see the operation. The proportion of the number of these animals which I have observed to divide in this manner, to the rest is scarcely one to fifty; so that it appears rather to arise from hurts received by some few animalcules among the many, than to be the natural manner in which these kinds of animals multiply; especially if we consider the infinite quantity of young ones which are visible to us through the transparent skins of their bodies, and even the young ones that are visible in those young ones while in the bodies of the old ones. But nothing more plainly shows them to be zoophites than this circumstance, That when, by accident, the extremity of their bodies has been shrivelled for want of a supply of fresh water, the applying more fresh water has given motion to the part of the animal that was still alive; by which means this shapeless figure has continued to live and swim to and fro while it was supplied with fresh water.

The discovery of living animalcules in the semen of most animals is claimed by Mr. Lewenhock and Mr. Nicholas Hartsoeker; who both say they published it about the end of the year 1677, or beginning of 1678; but Mr. Lewenhock having made by far the greatest number of experiments concerning them, the discovery is commonly attributed to him. According to this naturalist, the animalcules are found in the semen masculinum of every kind of animal; but their general appearance is much the same, nor doth their size differ in proportion to the bulk of the animal to which they belong. The bodies of all of them seem to be of an oblong oval form, with long tapering slender tails issuing from them; and as by this shape they resemble tadpoles, they have been frequently called by that name; though the tails of them in proportion to their bodies are much longer than the tails of tadpoles: and, it is observable, that the animalcules in the semen of fishes have tails much longer and more slender than the tails of those in other animals; insomuch that the extremity of them is not to be discerned without the best glasses and the utmost attention. The numbers of these animalcules are inconceivable. On viewing with a microscope the milt, or semen masculinum, of a living cod-fish, innumerable multitudes of animalcules were found therein, of such a diminutive size that he supposed at least 10,000 of them capable of being contained in the bulk of a grain of sand; whence he concludes, that the milt of this single fish contained more living animalcules than there are to be

people living in the whole world. To find the comparative size of these animalcules, Mr. Lewenhoek placed a hair of his head near them; which hair, through his microscope, appeared an inch in breadth; and he was satisfied, that at least sixty such animalcules could easily lie within that diameter; whence, their bodies being spherical, it follows that 216,000 of them are but equal to a globe whose diameter is the breadth of a hair. He observed, that when the water wherewith he had diluted the semen of a cod-fish was exhaled, the little bodies of the animalcules burst in pieces; which did not happen to those in the semen of a ram; and this he imputes to the great firmness and consistency of the latter, as the flesh of a land animal is more compact than fish. These animalcules appear to be very vigorous, and tenacious of life; for they may be observed to move long after the animal from which they are taken is dead. They have this peculiarity also, that they are continually in motion, without the least rest or intermission, provided there is fluid sufficient for them to swim about in. These animalcules are peculiar to the semen: nothing that has the least token of life being discovered by the best glasses, either in the blood, spittle, urine, gall, or chyle. Great numbers, however, are to be found in the whitish matter that sticks between the teeth; some of which are of an oval figure and others resemble eels.

Animalcules are said to be the cause of various disorders. The itch, from several experiments, is affirmed to be a disorder arising from the irritations of a species of animalcules found in the pustules of that disease; whence the communication of it by contact from one to another is easily conceived, as also the reason of the cure being effected by cutaneous applications. On this foundation some have attributed the small-pox, measles, and other infectious diseases, and others the epilepsy, &c., to animalcules. Languis goes farther, and pretends to reduce all diseases in general to the same principle. A late writer at Paris, who assumed the title of an English physician, has done more. He not only accounts for all diseases, but for the operations of all medicines upon the hypothesis of animalcules. He had peculiar animals for every disease; scorbutic animalcules, podagric animalcules, variolous animalcules, &c., all at his service. Journ. des Sçav. tom. lxxxii. p. 535, &c. But as most discoveries in natural philosophy have laid a foundation for the warm imaginations of some men to form visionary theories, to the great prejudice of real knowledge, so those relating to animalcules have been drawn in, however improperly, to support the most whimsical and chimerical systems.

For more on this subject the reader may consult the papers of Lewenhoek, Baker, &c., in the Philosophical Transactions, Baker on the Microscope, Kanmacher on the Microscope, &c.

ANIMAS, Rio de los, or River of Souls, a river of New Mexico, rising on the western side of that ridge of mountains which intervenes between the rivers that flow into the gulf of Mexico and those which run into the Pacific Ocean. It joins the river Nebajoa, a little below its junction with the Rio Colorado.

Animated Mercury, among chemists, quicksilver, impregnated with some subtile and spirituous particles, so as to render it capable of growing hot when mingled with gold.

Animated Needle, a needle touched with the loadstone.

Animation has been more accurately defined the informing an animal body with a soul.—The different hypotheses of physicians and philosophers, concerning the time of animation, had their influence upon penal laws made against artificial abortions; till Charles V., by a constitution published in 1532, introduced the distinction between a vital and non-vital fœtus. Accordingly a fœtus is said to be animated when it is perceived to stir in the womb, which usually happens about the middle of the term of gestation.

Animation, in alchemy, the operation of fermenting any metal by its conjunction with mercury.

ANIME, a resin exuding from the trunk of a large American tree, called by Piso jetaiba, by the Indians courbaril, a species of hymenæa. This resin is of a transparent amber colour, a light agreeable smell, and little or no taste. It dissolves entirely in fire, but not very readily in spirit of wine; the impurities, which are often great, remaining behind. The Brasilians are said to employ anime in fumigations for pains and aches proceeding from cold; with us, it is rarely, if ever, made use of for any medicinal purposes. There are two species of it, viz. 1. Eastern anime, distinguished into three kinds; the first white; the second blackish, in smell like myrrh; the third pale, resinous, and dry. 2. Western anime, which is transparent, and of a colour like that of frankincense; its smell is very agreeable, and it easily consumes in the fire.

Anime, in heraldry, a term used when the eye of a rapacious creature are borne of a different tincture from the creature itself.

ANIMELLÆ, the glands under the ears, &c. called also lacticinia.

ANIMETTA, in ecclesiastical writers, the cloth wherewith the cup is covered in the eucharist.

ANIMO Corde, a keyed instrument, a clavier, invented by John Jacob Schnell in 179

ANIMOS'ITY. Lat. *animosus*, from *animus* or *animus*; denoting the vigorous and courageous disposition of the soul. Applied to the exercise of a malevolent feeling.

> How apt nature is, even in those who profess an eminence in holiness, to raise and maintain animosity against those whose calling or person they pretend to find cause to dislike. *Bp. Hall's Letter of Apology*

> They were sure to bring passion, *animosity*, and malice enough of their own, what evidence soever they had from others. *Clarendon*

> If there is not some method found out for allaying these heats and *animosities* among the fair sex, one does not know to what outrages they may proceed. *Addison*

ANIMUS, the mind, the rational faculty, in distinction from anima, the soul, where the faculty resides.

ANINGA, in botany, an aquatic plant growing in the Carribee islands, the root of which is much used in the refinement of sugar. T

decoction of this root is a more certain, as well as more safe method of clarifying sugar, than sublimate and arsenic, which were used for this purpose before the discovery of the aninga. From this root is also compressed an oil of great medicinal use in fermentation.

ANIO, or ANIEN, in ancient geography, a river of Italy, now IL TEVERONE, which see.

ANJOU, a ci-devant province of France, which, in conjunction with the late provinces of Maine and Touraine, now forms the four departments of Maine Sarte Maine, Loire, Indre and Loire. It was bounded by Tousaine, Poictou, Bretagne, and Maine; and extended seventy-five miles in length, and sixty in breadth. Through it run five navigable rivers; the Loire, the Vienne, the Foue, the Mayenne, and the Sarte. The air is temperate, and the country agreeably diversified with hills and meadows. It produces white wine, wheat, barley, rye, oats, peas, beans, flax, hemp, walnuts, chestnuts, cider, and fruit trees of all kinds, and pasture proper for horses. Its greatest riches consist in cows, oxen, and sheep. There are also several coal and iron mines; quarries of marble, slate, and stone for building. It has also several saltpetre works and glass-houses. The remarkable towns, besides Angers the capital, are Saumur, Brissac, Pons de Cea, Le Fleche, and Beaufort. St. Louis bestowed on his brother Charles this province in 1246, but in 1328 it again fell to the crown with Philip IV. John I. raised it to the rank of a ducal peerage, and gave it to his son Louis I.; but in 1480 it reverted once more to the crown. Different princes of the blood bore subsequently the title of Anjou, till Louis XV. conferred it, together with the province, on his grandson Louis Stanislaus, also count of Province, afterwards Louis XVIII.

ANIRAN, in mythology, one of the Persian Genii, supposed to preside over weddings, and take cognisance of every occurrence on the 30th day of the month, on which account this day is called Aniram, and kept with much solemnity as a festival.

ANISATUM SACCHARUM, in medicine, sugar of anise. It is a good carminative.

ANISCALPTOR, in anatomy, the latissimus dorsi.

ANISE, anisum, Lat. A species of apium or parsley, with large sweet-scented seeds. This plant is not worth propagating in England for use, because the seeds can be had much better and cheaper from Italy.

ANISE-SEED, in medicine, the seed of the plant anise, containing essential oil. It is carminative, expelling wind, given either at the mouth or in clysters. It is useful against cold affections of the lungs, difficulty of breathing, and asthma. It is often used as a corrector of the strongest purgatives. The oil distilled from the seed is used for the same purposes, and is often applied outwardly in carminative and anodyne liniments; particularly for the pleurisy and other pains in the side.

ANISE-SEED, STARRY, anisum stellatum, a seed brought chiefly from Tartary, much used by the Dutch and Chinese in their tea, by them called zingi or damor.

ANISIFOLIUM, the limonia acidissima of Linnæus.

ANISOCYCLA, in antiquity, a machine constructed of unequal circles, by means of which the ancients discharged their scorpions, or crossbows.

ANISOMELES, in botany; from *ανισος*, unequal, and *μηλα*, the cheeks, or parts around the mouth, alluding to the corolla having unequal lips. Class, didynamia; order, gymnospermia; natural order, verticillata. Its essential characters are: CAL. quinquepartite, tubular: COR. upper lip smallest, lower tripartite: STAM. prominent ascending: ANTHERS, double cells, longer ones halved: SEEDS smooth. The species are, 1. A. Moschata, musky anisomeles. 2. A. Inodora, scentless anisomeles. 3. A. Salvifolia, sage-leaved anisomeles. These three are natives of New Holland. 4. A. Ovata, broad-leaved anisomeles, a native of the East Indies.

ANISOPOGON, from *ανισος*, unequal, and *πωγων*, a beard, alluding to the inequality of the awns. Class, triandria; order, digynia; natural order, gramina. Its essential characters are: CAL. two membranous, ribbed, equal valves, single-flowered: COR. stalked, two-valved. There is but one species, A. avenaceus, oat-like anisopogon

ANIVA, or TAMBAOUORA, a large commodious bay at the southern extremity of the peninsula of Saghalin, bounded by Cape Aniva and Cape Crillon. The shores are steep, and inaccessible mountains are at a very short distance. The Japanese have a settlement here. They build their houses of wood, one story high, and instead of glass they use oiled paper. They employ the natives, whom they keep in a state of slavery, in catching and drying fish. Long. 144° 20′. E., lat. 46° 10′ N.

ANKER, (Ancker, Dut.) A liquid measure chiefly used at Amsterdam. It is the fourth part of the awn, and contains two stekans; each stekan consists of sixteen mengles; the mengle being equal to two Paris pints.

ANKER, in English measure, contains about thirty-two gallons.

ANKERSTROM (John James), a Swedish officer, who having been convicted of holding a treasonable correspondence with the Russians, during the Swedish war, assassinated king Gustavus at a masked ball in 1792; although he had received a pardon for this offence: he was beheaded in the same year, after first having lost his right hand.

AN'KLE, *n.* } Ancleop. The joint which
AN'KLED, } joins the leg to the foot.
AN'KLE-BONE. }

In the name of Jesus Chryst of Nazareth, ryse vp and walke; And he toke hym by the ryght hande, and lyfte hym vp. And immediately his fete and *ankle-bones* receaued strēght.

Bible, 1539, *Actes*, iii.

These manacles upon my arm,
I, as my mistress' favours wear;
And for to keep my *ankles* warm,
I have some iron shakles there.

Loyalty confined, *Percy's Reliques*, vol. ii. p. 335.

One of his *ankles* was much swelled and ulcerated on the inside, in several places. *Wiseman.*

My simple system shall suppose,
That Alma enters at the toes;
That then she mounts by just degrees
Up to the *ankles*, legs, and knees. *Prior.*

ANKLE, in surgery. The ankle is subjected to be luxated, either inward or outward, backward or forward. When the ankle is luxated inward the bottom of the foot is turned outward; and vice versa, when it is luxated outward the bottom of the foot is turned inward; which latter case is, indeed, much more frequent than the others. If it is dislocated forward, the heel becomes shorter, and the foot longer than it should be; and if backward, the contrary signs to these will appear. The ankle, however, can scarce possibly be luxated outwards, unless the fibula be separated from the tibia, or else quite broken, which may happen to the external ankle to be attended with very grievous symptoms, especially when occasioned by some great external violence. Nor can it indeed well happen otherwise in this case, since the distortion of the foot must necessarily overstrain the adjacent tendons, ligaments, and nerves, and thence excite very violent pains and other bad symptoms; or the veins and arteries may also be very easily lacerated, which will occasion a large extravasation of blood about the whole foot, and too often give rise to a gangrene. It is, however, necessary to observe, that the ankle is not always luxated after it has been violently strained by leaping, or turning the foot on one side; for it sometimes happens that the ankle is not dislocated on these occasions, but only on the parts violently contused and strained. The ankle, when truly luxated, is more or less difficult to be reduced, according to the violence of the force by which the accident was occasioned. The most ready way, however, of reducing a luxation of the ankle, is to place the patient upon a bed, seat, or table, letting the leg and foot be extended in opposite directions by two assistants, while the surgeon replaces the bones with his hands and fingers in their proper situation. When the foot is by this means restored to its proper position, it is to be well bathed with oxycrate and salt, and then carefully bound up with a proper bandage. The patient must be enjoined to keep his bed for a considerable time, till the bad symptoms are gone, and the ankle has recovered its strength, so far as to bear the weight of the body without any uneasiness or danger. We have an account of the menses regularly evacuated at an ulcer of the ankle, in the Edinburgh Medical Essays, vol. iii. art. 9.

ANLACE, a falchion, or sword, shaped like a scythe.

ANN CAPE, that point of land which forms the north side of Massachusetts Bay, so named in honour of Ann wife of James I. Lat. 42° 45′ N., long. 70° 17′ W.

ANN FORT, a fortress, the head of Wood Creek, New York. It lies two leagues and a quarter from Skenesborough Fort, and ten miles east-south-east from Fort George. When General Burgoyne attempted to pass through this part of the country to Fort Edward, his army could only proceed at the rate of a mile a day, so wild was the country and so interpersed with marshes and woods. They had no fewer than forty log-bridges to construct, one of which was two miles in length; circumstances which in the present improved state of the country will appear hardly credible.

ANN, or ANNAT, in Scotch law, half a-year's stipend, which the law allows the executors of ministers of the church of Scotland, over and above what was due to the minister himself for his incumbency.

ANN, ST. a river of Lower Canada, flowing from the mountains north of Quebec, and falling into the St. Lawrence about fifty miles above that city. The length of its whole course does not exceed seventy miles, and the navigation is much impeded by falls, rapids, and shallows; but at its junction with the St. Lawrence, it attains a breadth of 400 yards, and is a noble stream. Here lie the islands of St. Marguerite, Ignace, Dutage, and Durable, abounding in rich pasture and meadow land, and on the eastern shore of the main land is a village named St. Ann, containing a handsome church, chapel, and about fifty houses. Another river, flowing into the St. Lawrence opposite the island of Orleans, is also called by this name.

ANN, ST. a port on the east side of the island of Cape Breton, much frequented by fishing vessels; on the north-west of the entrance into Labrador Lake, N. lat. 47°, W. long. 60°.

ANN, ST. a town on the river St. John's, in the province of New Brunswick, eighty-one miles from St. Johns Town.

ANNA, of חַנָּה, Heb. gracious, a Jewish prophetess, the daughter of Phanuel, of the tribe of Asher. She had been early married, and had lived seven years with a husband. After his death she devoted herself to the service of God; and it was while thus employed, that, finding the virgin Mary with her infant son in the temple, she joined with the venerable Simeon in thanking God for him, and in bearing testimony to him as the promised Messiah.

ANNA, a province of Arabia Deserta, and one of the three principalities into which it is divided.

ANNA, or ANAH, one of the chief cities of the above principality, situated on the west bank of the Euphrates, in a fruitful and pleasant soil, 220 miles south-east of Aleppo, and consists of one street, about five miles long, but thinly peopled. Every house has a garden belonging to it, and these are loaded with fruit trees, bearing lemons, oranges, citrons, quinces, figs, dates, pomegranates, olives, &c. in great plenty. Some of the flat grounds are sown with corn and other grain, which yield likewise considerable crops. In 1807 this place was attacked by the Wahabees, who perpetrated the most horrible cruelties. They massacred the greater part of the inhabitants, set the town on fire, and then retreated with the plunder, carrying off at the same time several women and children into slavery. This city is the common rendezvous of the robbers that infest the country, and from which they disperse themselves into all parts of the Desert. It is with great difficulty that the Turkish aga, and the janissaries who are kept here, can levy the tribute on the commodities carried through this

city, which is one of the great thoroughfares for the passage of the caravans to and from Aleppo, Tripoli, Damascus, Bagdad, and some other parts of the Turkish empire. Lon. 41° 15′ E., lat. 33° 30′ N.

Anna, the daughter of Belus king of Tyre, and sister of Dido, whom she accompanied in her flight. After her death she attempted to return to Tyre, and is said to have been thrown on the coast of Italy, where she was well received. Some say that she leaped into the river Numicus to escape from Lavinia the wife of Æneas, who was jealous of her. She was worshipped by the ancient Romans under the title of Anna Perenna; and sacrifices were offered to her.

Anna, or Anne Ivanovna, empress of Russia, was the daughter of the czar Ivan Alexiovitch, born in 1693. She married Frederick William, duke of Courland, in 1710, who died the following year and left no issue; when she formed an intimacy with Ernest John Biren, a man of low family. On the death of Peter II. in 1740, the last of the male issue of Peter the Great, she succeeded to the throne of Russia. She was herself naturally meek and merciful, and her reign was in some respects prosperous; but she was compelled to many acts highly repugnant to her inclination by the wretch to whom she had yielded up her affection. She died in 1740, aged 47, and left her crown to her grand nephew Ivan, under the guardianship of Biren, as he was then only two years of age.

Annaberg, St., a mining town of Saxony, in the circle of the Erzgeberg, in Misnia, twenty-one miles from Freyberg, and thirty-six from Dresden. It contains about 600 houses, and 3500 inhabitants, most of whom are employed in the lace-trade, as the mines are now nearly exhausted. The public establishments are a mine-office, an academy, an orphan-house, and a large machine for the twisting of red silk. In the vicinity of this town stands the huge basalt rock, called Pilberg, and also the hill of Schreckenberg, in which was formerly a mine of silver, which gave name to an old German coin which is now disused. In 1731 this town sustained great loss from fire.

ANNAGH, an island on the coast of Ireland, about five miles in circumference, between the isle of Achil and the main land.

ANNAGH-NAN, or Annachnan, a small island on the south-west coast of the county of Galway, Ireland, twenty-two miles west from Galway.

ANNAGOONDY, or Anna Gundi, the modern or Canara name of the ancient city of Vijanagur, in the Balaghaut ceded districts. It stands on the north bank of the Toombuddra, in north latitude 15° 14′, and east longitude 76° 34′ opposite the city of Allpatna, which is sometimes considered as a portion of the same place; and distant 260 miles from Seringapatam.

The ruins of the walls of this place enclose an area of eight miles in circuit; and the remnants of streets of from thirty to forty yards in width, which one is almost left entire, would indicate the ancient size to have been much larger

The Portuguese historians attribute the origin of this place to a prince Boka, who flourished A.D. 1200, but more credible accounts assign it to Belaldro king of the Carnatic, who is said to have built it in 1343, to strengthen the northern frontier of his dominions. It afterwards became the capital of an independent sovereignty, and in modern times was found by Hyder Ali tributary to the Mahratta chiefs.

A rajah of nominal power then and ever since has dwelt here, but Tippoo in 1786 burnt his palace to the ground, and destroyed the records of his empire. After various struggles the rajah recovered his dominions in 1799, and shortly after submitted to the English, who allow him 1500 rupees per annum.

ANNALE, in the church of Rome, a term applied to the masses celebrated for the dead during a whole year.

ANNALES, in writers of the middle age, denote cattle under two years of age. Also a yearly rent, or annual revenue.

Annales Baculi, a kind of wooden almanacs used among our ancestors, called also runstocks.

Annales Libri, in the civil law, books wherein the acts of a whole year were contained, in distinction from semestres libri, wherein the acts of six months only were contained.

ANNALIFFEY, a river of Ireland, in the province of Leinster, which rises in the county of Wicklow, and, by a circuitous course, runs into the county of Kildare; thence passes through the Leinster aqueduct under the great canal, and is precipitated from the rock of Leixless in a beautiful waterfall; whence it passes through the county and city of Dublin, and falls into Dublin Bay.

ANNALIS Actio, in the civil law, denotes an action which may be put in practice any time within the year. In the like sense we meet with annale decretum, annalis rescissio, &c.

Annalis Clavus, a nail which the prætor, consul, or dictator, drove into the wall of Jupiter's temple annually upon the ides of September, to show the number of years. This custom was changed upon reckoning years by consulships. The ceremony was afterwards occasionally performed to avert the plague.

Annalis Exceptio, an iniquitous privilege anciently granted the people of Italy, that whoever had made a contract could not be compelled to the performance, of what had been agreed on, within the year. Some extended this privilege to the year exclusive of all holidays.

AN'NALIZE, *v.* } Lat. *annalis*. To recite
AN'NALIST, } events that happened every
AN'NAL. } year, from one year to another, concisely, without giving all the particulars.

> Could you with patience hear, or I relate,
> O nymph! the tedious *annals* of our fate!
> Through such a train of woes if I should run,
> The day would sooner than the tale be done.
> *Dryden.*

Their own *annalist* has given the same title to that of Syrmium. *Atterbury.*

> Let not Ambition mock their useful toil,
> Their homely joys, and destiny obscure;
> Nor Grandeur hear with a disdainful smile,
> The short and simple *annals* of the poor.
> *Gray.*

Annals. The difference between annals and history is variously assigned by different authors.

Some say that history is properly a recital of things which the author has seen, alluding to the etymology of the word: history in the Greek signifying the knowledge of the things present, for ἱστορειν properly signifies to see. On the contrary, annals, say they, relate to the transactions of others, and such as the writer never saw. Of this opinion the great annalist, Tacitus himself, seems to have been; because the first part of his work, which treats of former times, he calls annals; but when he comes down to his own times, he changes its title, and calls it history. Asellio, however, and the moderns in general, entertain the very opposite idea, and restrict annals to a bare relation of what passes each year; whereas history relates not only the transactions themselves, but also the causes, motives, and springs of them. The annalist merely states his facts, but the historian reasons and descants on them. Annals require brevity; history demands ornament. Of this last opinion seems Cicero to be, when he styles annalists, 'non exornatores rerum, sed tantum narratores.' He adds, that history in its original was the composition of annals. He thus relates the origin of annals: To preserve the memory of transactions, the pontifex maximus wrote what passed each year, and exposed it on a table in his own house, where every one was at liberty to read it. This they called annales maximi; and this custom was kept up till the year of Rome 620. These annales maximi consisted of eighty books. They were most of them destroyed in the burning of the city by the Gauls. Similar annals were kept from the earliest ages by the Egyptians, Babylonians, Persians, Chaldeans, &c. Authors, in imitation of these, adopted this simple and naked way of relating facts; and were hence denominated annalists. Such were Cato, Pictor, Piso, Antipater, &c.

ANNAMABOE, a large native town on the Gold Coast of Africa, containing a population of 10,000 inhabitants, and once a very considerable market for slaves, has given name to a British fort in this part of the world, which ranks next to that of Cape Coast Castle, and is maintained by the African Company at an expense of about £1900 per annum. In 1808 the Ashantees, a powerful modern race of conquerors from the interior, came down upon this coast in great numbers, and the inhabitants of the town of Annamaboe having espoused the cause of the Fantees against the invaders, the king of Ashantee, after defeating the former, marched with his whole forces upon this place, which he burnt to the ground, and immediately attacked the fort of the British. His army is said to have amounted at this time to upwards of 20,000 men. Subsequent opportunities afforded to our countrymen of remarking its organisation, make the result truly surprising; for although the British force at this point did not exceed thirty men, and the fort is entirely commanded by a height in the rear, it successfully resisted the attack—a circumstance which made so respectable an impression on the mind of the king, as to induce him to court our friendship, and ultimately to receive an embassy from Cape Coast Castle.

The origin of the quarrel was the protection which the Fantees had afforded two chieftains of the interior, who had beheaded the messengers of the king. Being defeated at every encounter with the Ashantees, the Fantees at last prevailed upon the Annamaboes to receive and support Cheeboo and Apoutay. 'At this period,' says Mr. Meredith, 'the governor at Cape Coast Castle being under some apprehension for the safety of the British settlements, was inclined to send a flag of truce with a message to the king of Ashantee, who was now (May, 1806) at Abrab, and only fifteen or twenty miles from the coast.' This plan was opposed by the Annamaboes, and the governor, though anxious to know the disposition of the king, and to offer his mediation between the parties, gave way for the moment to their confident anticipations of victory. A division of the Ashantee army soon after attacked and destroyed the Dutch fort at Cormantine, and the captain of the division established his residence there. This being the first time the Ashantees had extended their conquests to the ocean, the captain is said to have been so much elated, that he went and dipped his sword three times in the sea, some of which he conveyed to the king as a proof of his success. A British flag of truce being now sent to the king of Ashantee, to ask his purpose in approaching the coast, he sent word, that when the governor would send him twenty barrels of gunpowder, he should be told what were the king's designs!

After a week had elapsed without farther intelligence, the Ashantee commander at Cormantine endeavoured to establish himself at Agah, a village about a mile eastward of Annamaboe, when the whole of the inhabitants of the latter town marched out for the purpose of repulsing him. The British governor could now observe every movement of this new and formidable enemy from the walls of the fort. The Ashantee fire was powerful, regular, and well-directed; and the division, though not more in number than a third of their assailants, held the Annamaboes for a long time in check, and retreated in excellent order.

On the morning of the 15th the whole of the Ashantee army was observed to be in motion, and the utmost alarm prevailed at Annamaboe; the inhabitants had neglected the advice of the governor to protect the avenues of the place, as well as his invitation to send the women, children and helpless natives into the fort. Vollies of musquetry seemed to approach nearer and nearer; about eleven P. M. the whizzing of the bullet was distinctly heard within the fort, whither the defenceless part of the inhabitants now rushed by hundreds, while the Ashantees were pursuing the rest into the town in all directions.

In vain were the great guns fired over the town with a view of intimidating the assailants. A twenty-four pounder discharged grape-shot along the beach and did immense execution amongst them, in vain; a three-pounder, which flanked the eastern gate, also fired grape-shot. The Ashantees pressed to the very muzzle of the guns, and every man who was not protected by the works, was marked by their well-conducted fire and killed or wounded. The governor

the fort at this time was struck by a ball, which passed through his mouth, taking away four of his teeth, and shortly after was wounded in his left arm. An officer and two men were wounded about the same time, and one man killed.

'Things now assumed a more serious and dangerous aspect than was apprehended, and gave the garrison a strong assurance of the disposition of the enemy, who, it was evident, intended to bend his utmost efforts against the fort. The Ashantees were confident that, by gaining possession of it, a large booty would be obtained. However, the small number that composed the garrison of Annamaboe at this period, consisting of governor White, Messrs. Meredith, Swanzy, Smith, and Baynes; also four free Mulattoes, and twenty men including soldiers, artificers, and servants, were confident of the security of their situation; the walls being high, and accurately flanked, and the gates secured and well barricadoed. The governor, from the nature of his wound and from great debility in consequence of much effusion of blood, being constrained to retire, and the command of the fort having devolved on the senior officer, who perceiving that the cannon in one quarter could not be used with effect, for the enemy fired with such precision as to cut off every man who was exposed at an embrasure, depended solely on the musquets; and another man having been killed about noon and two more wounded, the garrison was reduced to the small number of eight, including officers, who could be depended upon; and the Ashantees were using every effort to force the western gate, but were twice repulsed with no small loss. A third time they attempted it and endeavoured to apply fire to the gate; but the man who brought the materials for that purpose, extinguished the fire by falling a corpse upon it. In all their attempts they were defeated by musquetry alone, and notwithstanding that their efforts to gain an entrance into the fort proved ineffectual, the combat was continued until six o'clock. After the cessation, and before that darkness came on, the garrison used all possible energy in repairing injuries and preparing for the defensive, in case of hostilities being renewed in the night.' Next morning it was discovered that of 15,000 souls which the town contained, two-thirds had perished in the conflict; about two thousand of every description took refuge in the fort. See ASHANTEE.

ANNAMOOKA, one of the Friendly Islands, in the Polynesian group of the South Sea. It was discovered by Tasman, a Dutch navigator, in 1643; and visited by Captain Cook in 1774 and 1777; by Captain Bligh in 1787, and Captain Edwards in 1791. It is well cultivated in many places. The plantations of yams and plantains are extensive and often enclosed with neat fences of reeds. The bread fruit and cocoa trees are interspersed with little order, but generally near the habitations of the natives; and the other parts of the island, especially towards the sea, are covered with trees and bushes of a luxuriant growth. The inhabitants are friendly and hospitable, but addicted, like most barbarous tribes, to pilfering from their European visitors. Annamooka is of a triangular form, from ten to twelve miles round, and of a similar character and productions with the whole group of the FRIENDLY ISLANDS, which see. In the centre is a large salt-water lake. The shores of the island are environed with sand-banks and islets; but ships, in passing, generally call for wood, of which it contains a great abundance. There is one tree called by the natives Faitanoo, a species of pepper, so inflammatory to the eyes and any part of the body with which it comes in contact, that the most violent effects have frequently been produced by the attempting to cut it down. The inhabitants of this island are of a more licentious disposition than those of the rest of the group: cutaneous disorders abound, and self-mutilation is practised in cases of death or calamity to an unusual degree. Long. about 174° 0′ W., lat. 20° 0′ S.

ANNAN, a river of Scotland, which rises about four miles north of Moffat, in a remarkable hill in the county of Peebles, which also gives rise to the Tweed, the Clyde, and the Evan, and, after a course of forty miles through Dumfrieshire, falls into the Solway Frith. It abounds with salmon from thirty to forty pounds weight, trouts, eels, roaches, &c. and a peculiar species of spotted eels called rampars, which, it is said, will attack both men and cattle when in the water.

ANNAN, the capital of Annandale, in Scotland, and situated on the river of that name. This place is a royal borough, and has some trade in wine, corn, and timber. Vessels of about 250 tons can come within half a mile of the town; and of sixty as high as the bridge, which consists of five arches. A fabric for carding and spinning cotton has succeeded here, and the population is upon the increase. Here was formerly a castle, which was built by the Bruces after they became lords of Annandale. It sends a member to parliament in conjunction with Dumfries, Kircudbright, Lochmaben, and Sanquhar. Lon. 3° 4′ W., lat. 55° 0′ N.

ANNAND (William), dean of Edinburgh, was born in 1633, and died in 1689. He wrote, 1. Fides Catholica, quarto, London, 1661. 2. Panem Quotidianum, in Defence of the Book of Common Prayer, quarto, 1661. 3. Pater Noster, a Treatise on the Lord's Prayer, &c.

ANNANDALE, a district of Dumfries, Scotland, of which Lochmaben castle was formerly the chief fortalice. It is a fertile vale, twenty-four miles long, and about fourteen miles broad. From its vicinity to the English border, the greatest part of it was, until a recent period, overrun by depredators of all kinds, uncultivated and common; but within the last forty years the wastes and commons have been divided and brought into culture. Annandale formed a part of the Roman province of Valentia; and Severus's wall ending here, it abounds with Roman stations and antiquities. The camps at Pirrens in Middlebie, and on the hill of Brunswick, are entire; and the traces and remains of a military road are visible in different parts of the country. The ruins of the house or castle of Auchincass, in the neighbourhood of Moffat, once the seat of that potent baron Thomas Randolph, earl of Murray, lord of Annandale, and regent of Scotland, in the minority of David II.

covers above an acre of ground, and conveys an idea of the plan and strength of the building: and the ancient castle of Comlongan formerly belonging to the Murrays, earls of Annandale, is still in a tolerable state of preservation; but most of the other fortresses are sunk into decay.

ANNAPOLIS, the chief town of Maryland in North America. St. Mary's was once the capital of this state; and the town of Annapolis was known by the name of Severn, and so called after the river on which it stands. It received its present name in 1694, when it was made a port town, and the residence of a collector and naval officer. It is at present a small but thriving city, being very advantageously situated on the borders of the Chesapeake bay. The state-house is in the centre of the town, from which well-built streets branch off in all directions. It is distant thirty miles south of Baltimore, and thirty-two east by north of Washington. Population about 2000.

Annapolis River, in Nova Scotia, North America, a small stream rising amongst the head waters which principally pass into the basin of Minas: Annapolis River takes its course into the bay of Fundy, through a basin called after its own name. It is navigable ten miles for ships of any burden, and about five miles further for vessels of 100 tons; the tide flows up it about thirty miles, and boats reach within twenty miles of Horton.

Annapolis County, a county of Nova Scotia, adjoins King's County, and contains the townships of Clare, Monckton, Wilmot, Granville, and Annapolis, of which the first two are the chief.

Annapolis Real, or Royal, to which the name of Port Royal was given by the French, and more remotely that of Severn by the English army, who first settled here in the reign of Queen Anne, is a handsome city of Nova Scotia, standing on the shores of the Bay of Fundy, on the south side of the mouth of the River Annapolis, and commanding one of the finest natural ports in the world. The basin is large enough to contain several hundred ships, being two miles in length, by about one broad; nor has it any where less than from four to five fathoms of water; in most places six or seven; and on one side as much as eighteen fathoms. In the centre is Goat Island, which, with the mouth of the harbour, is frequently enveloped in fogs, a circumstance which renders the latter at some periods of the year very difficult to enter with safety. The city is regularly fortified and incapable of attack, except from bombardment; many handsome public offices and private houses meet the eye, but the place has never flourished as a commercial entrepot, and is not much enlarged since its first establishment in the reign of Queen Anne. The complement of the garrison is about 100 men. The French attacked and took this place by an expedition from Santa Cruz in the year 1605, when they made it 'the very Dunkirk of America,' says Alcedo, 'serving as an asylum for privateers and cruisers to the ruin of commerce and the fisheries.' The fact is, they endeavoured to establish it as a principal port for the whale-fishery of the neighbouring seas. It was soon, however, retaken by the British under colonel Nicholson. See British America.

ANNAS, or Annanus, the son of Seth, high priest of the Jews, and father-in-law to Caiaphas who also enjoyed that office. Both of them were persecutors of our Lord and his apostles. Annas was high priest eleven years in all; but as that office was then only annual, he alternately succeeded and was succeeded by his son-in-law, and four of his sons, under Augustus and Tiberius.

ANNAT (Francis), a French Jesuit, and confessor to Louis XIV. was born in 1590. His writings are numerous in the Latin and French languages. He distinguished himself particularly against the provincial letters of M. Pascal. He died at Paris in 1670. His works have been collected in three volumes folio.

ANNATS, in ecclesiastical history, were first exacted by Antonius, bp. of Ephesus from all bishops consecrated by him, proportionately to the annual revenue of their sees. The council of Ephesus, in 400, condemned this exaction. The time when annats were first introduced into Europe is not known; some refer it to the pontificate of Alexander IV.; others to that of John XXII. who, in the first year of his papacy, obtained a year's revenue of all the cathedral benefices. Clement V. was the first pope, who imposed annats on England. Matthew Paris, in his History of England for 746, relates, that the archb. of Canterbury, in virtue of a grant of the pope, received annats of all the benefices in England. Among the laws of king Ina, who began his reign in 712, there is an order for the payment of them. In after times, the holy see took the annats from the bishops and archbishops, and appropriated them to themselves; but the parliament under Henry VIII. gave them to the crown, and queen Anne restored them to the church, by appropriating them to the augmentation of poor livings.

ANNE, queen of Great Britain, second daughter of James II. by his first wife lady Anne Hyde, daughter of the earl of Clarendon, was born in 1664. In 1683 she married prince George of Denmark, by whom she had several children, but they all died young. Upon the invasion of England by the prince of Orange, and the retreat of the king, prince George, who was under the influence of lord Churchill, (afterwards duke of Marlborough,) with some other persons of distinction, joined the camp of the advancing prince. When this news reached London, the princess Anne, dreading the king's displeasure, withdrew herself, in company with the bishop of London and lady Churchill, to Nottingham. The intelligence of her flight was the occasion of great distress to her father. 'God help me,' cried he, in the extremity of his agony; 'my own children have forsaken me!' Upon her disappearance, so violent were the prejudices that prevailed, that James was thought to have put her to death; and if the truth had not been seasonably discovered, the populace, and even the king's guards themselves, might have been engaged, in revenge, to commence a massacre of the priests and catholics. When the settlement of the crown, in 1689, on the prince and princess of Orange

took place, it was enacted that the princess of Denmark should succeed after the death of the prince and princess of Orange. In 1702 she ascended the throne, and her reign was a continued blaze of public glory. Though naturally a feeble character, and consequently unfit to act decidedly for herself, she was fortunate in having some of the ablest statesmen in the world. The domineering power of the French was completely subdued by the valour of her troops, commanded by the duke of Marlborough; and an end put to a tedious war by the peace of Utrecht in 1713. But one of the greatest and most important events of this reign was the union of the English and Scottish nations. Amidst all its prosperous events, however, much party contention prevailed during the greatest part of her reign; and towards the close of it, her high church predilections, and her desire to provide for the re-instatement of her own, the Stuart family threatened to throw the nation into confusion, which was prevented by her death in 1714, in the 55th year of her age. Queen Anne, too much the dupe of her ministers and favourites, in her private character was amiable, and not without understanding; and was sufficiently beloved by her subjects to have been commonly designated the good Queen Anne. From the number of literary characters who flourished at this period, it has been styled the Augustan age of Britain.

ANNE OF AUSTRIA, queen of France, was the daughter of Philip III. king of Spain, and in 1615 married Louis XIII. On her cousin's death, his son being under age, she became sole regent of France during the minority. She, however, brought upon herself the contempt and hatred of the nation, by her boundless confidence in cardinal Mazarine, and was forced to flee from Paris. In a little time matters were accommodated; and when her son took the reins of government into his own hands, in 1661, she gave up all concern with public affairs, and spent the remainder of her life in retirement. She died in 1666.

ANNE OF BEAUJEU, daughter of Louis XI. king of France, was married to the duke of Bourbon, and during the minority of her brother Charles VIII. was appointed regent. She was an active and enterprising princess. She died in 1522.

ANNE OF CLEVES, the wife of Henry VIII. king of England, was the daughter of John III. duke of Cleves. A portrait of her, drawn by Holbein, having been shown to the English monarch by Thomas Lord Cromwell, he demanded her in marriage; but it was not long before he was disgusted with the 'Flanders Mare,' as he contemptuously called her, and a divorce ensued; when Anne, without seeming much disconcerted, returned to her own country, where she died in 1557.

ANNE'S DAY, St. a festival of the church, celebrated by the Latins on the 26th of July, and by the Greeks on the 9th of December, in honour of Anna the mother of the Virgin Mary.

ANNEAL', v. } Ang. Sax. Anælan. To heat
ANNEAL'ING. } in order to produce a proper temper; applied to metal and glass.

Assub, he saith, thilke same,
The whiche in sondrie place is founde,
Whan it is fall downe to grounde,
So as the fire it hath *aneled*,
Like vnto slime, whiche is congealed.
Gower, Con. A. book viii.

It is much suspected *aneyling* of glass, especially of yellow, is lost in our age as to the perfection thereof. *Fuller's Worthies, Kent.*

But when thou dost *anneal* in glass thy story,
————then the light and glory
More rev'rend grows, and more doth win,
Which else shews wat'rish, bleak, and thin.
Herb.

When you purpose to *anneal*, take a plate of iron made fit for the oven; or take a blue stone, which being made fit for the oven, lay it upon the cross bars of iron. *Peacham.*

Which her own inward symmetry reveal'd,
And like a picture shone in glass *anneal'd*.
Dryden.

ANNEALING OF GLASS, by the workmen called nealing, consists in placing the bottles, &c. whilst hot, in a kind of oven or furnace, where they are suffered to cool gradually; they would otherwise be too brittle for use. Metals are rendered hard and brittle by hammering: they are therefore made red hot, in order to recover their malleability; and this is called nealing.—The difference between unannealed and annealed glass, with respect to brittleness, is very remarkable. When an unannealed glass vessel is broken, it often flies into a small powder, with a violence seemingly very unproportioned to the stroke it has received. In general, it is in greater danger of breaking from a very slight stroke than from one of some considerable force. One of those vessels will often resist the effects of a pistol bullet dropped into it from the height of two or three feet; yet a grain of sand falling into it will make it burst into small fragments. This takes place sometimes immediately on dropping the sand into it; but often the vessel will stand for several minutes after, seemingly secure; and then, without any new injury, it will fly to pieces. If the vessel be very thin, it does not break in this manner, but seems to possess all the properties of annealed glass. The same phenomena are still more strikingly seen in glass-drops or tears: they are globular at one end, and taper to a small tail at the other; they are the drops which fall from the melted mass of glass on the rods on which the bottles are made, and fall into the tubs of water which are used in the work: the greater part of them burst immediately in the water. When those that remain entire are examined, they discover all the properties of unannealed glass in the highest degree. They will bear a smart stroke on the thick end without breaking; but if the small tail be broken, they burst into powder with a loud explosion. They appear to burst with more violence, and the powder is smaller in an exhausted receiver than in the open air. When they are annealed, they lose those properties. Glass is one of those bodies which increase in bulk when passing from a fluid to a solid state. If allowed to crystallise regularly, the particles are so arranged that it has a fibrous texture: it is elastic, and susceptible of long-continued vibrations; but when a mass of melted glass is suddenly exposed to the cold, the surface

crystallises, and forms a solid shell round the interior fluid parts; this prevents them from expanding when they become solid. They, therefore, have not the opportunity of a regular crystallisation; but are compressed together with little mutual cohesion: on the contrary they press outward to occupy more space, but are prevented by the external crust. In consequence of the effort of expansion in the internal parts, the greater number of glass drops burst in cooling; and those which remain entire are not regularly crystallised. A smart stroke upon them communicates a vibration to the whole mass, which is nearly synchronous in every part; and therefore the effort of expansion has little more effect than if the body were at rest; but the small tail and the surface only are regularly crystallised. If the tail be broken, this communicates a vibration along the crystallised surface, without reaching the internal parts. By this they are allowed some expansion; and, overcoming the cohesion of the thin outer shell, they burst it and are dispersed in powder. In an unannealed glass vessel the same thing takes place. Sometimes the vibration may continue for a considerable time before the internal parts overcome the resistance. If the vessel be very thin the regular crystallisation extends through the whole thickness; or at least the quality of compressed matter in the middle is so considerable as to be incapable of bursting the external plate. By the process of annealing the glass is kept for some time in a state approaching to fluidity; the heat increases the bulk of the crystallised part, and renders it so soft, that the internal parts have the opportunity of expanding and forming a regular crystallisation.

Annealing of Iron.—A similar process is used for rendering kettles and other vessels of cast iron less brittle. The greater number of metals diminish in bulk when they pass from a fluid to a solid state; iron, on the contrary, expands. When cast iron is broken it has the appearance of being composed of grains; forged or bar iron seems to consist of plates. Forged iron has long been procured, by placing a mass of cast iron under large hammers, and making it undergo violent and repeated compression. A process is now used for converting cast iron into forged, by heat alone. The cast iron is placed in an air furnace, and kept for several hours in a degree of heat, by which it is brought near to a fluid state. It is then allowed to cool gradually, and is found to be converted into forged iron. This process is conducted under a patent; although, if Reaumur's experiments upon cast iron be consulted, it will appear not to be a new discovery. By these experiments it is ascertained that if cast iron be exposed for any length of time to a heat considerably below its melting point, the texture and properties are not changed; but if it be kept in a heat near the melting point, the surface soon becomes lamellated like forged iron; and the lamellated structure extends farther into the mass in proportion to the length of time in which it is exposed to that degree of heat. When it is continued for a sufficient time, and then allowed to cool gradually, it is found to possess the lamellated structure throughout. Cast iron, then, is brittle, because it has not had the opportunity of crystallising regularly. When it is exposed to cold while fluid, the surface becoming solid prevents the inner parts from expanding and arranging themselves into regular crystals. When cast iron is brought near to the melting point, and continued for a sufficient length of time in that degree of heat, the particles have the opportunity of arranging themselves into that form of crystals by which forged iron is distinguished, and by which it possesses cohesion and all its properties. There appears, therefore, to be no other essential difference between forged and cast iron, except what arises from the crystallisation. Cast iron is indeed often not sufficiently purified from other substances which are mixed with the calx. It appears also to contain a considerable quantity of calx unreduced; for during the process for converting it into forged iron by heat alone, a pale flame rises from the metal till near the end of the process. This is owing to fixed air which the heat forces off from the calx. The expulsion of this air reduces the calx, and thereby frees the metal from that injurious mixture. That this explanation of the annealing of iron is probable appears also from the well-known fact of forged iron being incomparably more difficult of fusion than cast iron. A piece of forged iron requires a violent heat to melt it; but when it is reduced to a small powder, it melts in a much lower degree of heat. Iron diminishes in bulk when it passes into a fluid state, while most other metals increase in volume. The expansion which heat occasions to bring them to their melting point, will be favourable to their fluidity, by gradually bringing the particles to the same state of separation in which they are when the mass is fluid; but the expansion of iron by heat removes it farther from that state, and keeps it in the state which is favourable to the continuance of it in a crystallised form. It will not melt till the heat expand it so much that the cohesion of crystallisation be overcome. When it is reduced to a minute powder before it be exposed to the heat, it melts sooner. The crystals having been destroyed, that cohesion has no effect in preventing it from passing into a state of fluidity. Upon the same principles may be explained the almost peculiar property of welding possessed by iron, and the conversion of forged iron into steel.

Annealing of Platina.—The principles of annealing might perhaps also be applied to platina, a metal which has lately gained much attention. It possesses some of the properties of iron, but is more difficult of fusion than that metal. It is susceptible of being welded. The natural grains of it can scarcely be melted in the focus of the most powerful burning glass; but when it is dissolved in aqua regia, and precipitated by the vegetable alkali, it has been melted in small globules by the blow-pipe. When precipitated by sal ammoniac, it has been melted in a considerable mass in the heat of a furnace; but it is said to be hard and brittle. Many attempts have been made to procure a mass of it in a malleable state, but without success.

ANNEBAUT, a market town of Upper Normandy, France, with the title of marquisate, in-

cluded in the department of the Eure, arrondissement of Pont Audemer. It is seated on the river Rille, six miles south-east of Pont Audemer. Inhabitants about 500.

ANNECY, a city of France, the capital of the Savoy part of the duchy of Genevois. It is situated on the road between Geneva and Chamberry, about thirty miles from the former, in a delightful country, at the extremity of the lake of the same name. The canal of Thioux runs through the town, in its passage from the lake to the river Sier. Population 3440. Lon. 5° 57′ E., lat. 45° 56′ N.

ANNECY, a lake in the heart of the Genevois, in Savoy, about twelve miles in length, and two in breadth. It is very deep and cold, being formed of the melted snow from the surrounding mountains.

ANNECY LE VIEUX, a village in Savoy, on the site of an ancient town of that name, and one mile and a half north-east of the new town.

ANNESLEY (Samuel), a non-conformist divine, born in Cumberland in 1620. He was the grandfather by the mother's side, of the famous John Wesley, founder of the Methodists, and was educated at Queen's college, Oxford. His vehemence against the crown and the church procured for him a presentation to the vicarage of St. Giles, Cripplegate; but from this he was ejected, in 1662, for nonconformity. He died in 1696, aged 76. Some of his sermons were printed.

ANNET or ANNEY, one of the Scilly Isles, a mile from St. Agnes. It is uninhabited, but at low water the foundations of ruined habitations are visible, which are supposed to have been destroyed by the sea. There are some Druidical relics upon it.

ANNEX′, *v.* & *n.* } *Annecto, annexum; ad, necto;* to join one thing to another by a knot, or by knitting, or by hooking on. To fasten additionally; to unite to.
ANNEX′ABY,
ANNEXA′TION,
ANNEX′ION,
ANNEX′MENT.

Perchaunce there bee manye that are desirous of dignitie, but for al that, thei weigh not with thēselfes, what carke and care dignitie hath *annexed* vnto it.

Udall, 1 *Timothie*, chap. iii.

If loue be well searched and sought,
It is a sicknesse of the thought
Annexed and knedde betwixt tweine,
With male and female with o cheine.

Chaucer. The Romaunt of the Rose, f. 138. c. 4.

Where countries are *annexed* only by acts of state and submission, such submissions are commonly grounded upon fear, which is no good author of continuance; besides the quarrels and revolts which do ensue upon conditional and articulate subjections.

Bacon's Essays.

How *annexations* or benefices first came into the church, whether by the prince's authority or the pope's licence, is a very great dispute.

Ayliffe's Parergon.

——— Majesty
Dies not alone, but like a gulf doth draw
What's near it with it. It's a massy wheel
Fix'd on the summit of the highest mount;
To whose huge spokes ten thousand lesser things
Are mortis'd and adjoined; which when it falls,
Each small *annexment*, petty consequence,
Attends the boisterous ruin.

Shaksp. Hamlet, act iii. sc. 8.

I omit to speak of the habitual intemperance which is too commonly *annexed* to festival and delicious tables, where there is no other measure or restraint upon the appetite but its fulness and satiety, and when it cannot or dare not eat more.

Jeremy Taylor.

It is necessary to engage the fears of men, by the *annexation* of such penalties as will over-balance temporal pleasure.

Rogers.

ANNEXATION, in law, the uniting of lands or rents to the crown.

ANNI′HILATE, *v.* & *adj.* } Ad: *nihilum*, to nothing. To reduce to nothing, to deprive of existence, power, or efficacy.
ANNIHILA′TION,
ANNI′HILABLE.

Suche lawes made by hym as kyng Henry the sixth, had caused to be abrogated and *adnichilated*, he [Edward IV] agayne reuiued and renouated.

Hall, Ed. IV. f. 226.

There is nothing more certain in nature, than that it is impossible for any body to be utterly *annihilated*; as it was the work of the omnipotency of God to make somewhat of nothing, so it requireth the like omnipotency to turn somewhat into nothing.

Bacon's Essays.

It is impossible for any one to live in good humour and enjoy his present existence, who is apprehensive either of torment or of *annihilation*, of being miserable, or of not being at all.

Spectator.

Ye Gods, *annihilate* but space and time, and make two lovers happy!—was a pious and passionate prayer; but just as reasonable as many of the serious wishes of grave and solemn politicians.

Burke.

ANNIHILATION.—Christians, Heathens, Jews, the Siamese, Persians, &c. have their peculiar sentiments, conjectures, not to say dreams, concerning annihilation; and we find great dispute among them about the reality, the means, and ends, of annihilation. The first notions of the production of a thing from, or reduction of it to, nothing, Dr. Burnet shows, arose from the Christian theology; the words creation and annihilation, in the sense now given to them, having been alike unknown to the Hebrews, the Greeks, and the Latins. The ancient philosophers, in effect, denied annihilation as well as creation, resolving all the changes in the world into new modifications, without supposing the production of any thing new, or the destruction of any thing old. By daily experience they saw compounds dissolved; and that in their dissolution nothing perished but their union or connection of parts when in death the body and soul were separated, the man they held was gone, but that the spirit remained in its original the great soul of the world, and the body in its earth from whence it came; these were again wrought by nature into new compositions, and entered new states of being which had no relation to the former. The Persian brahmins hold, that after a certain period of time, consisting of seventy-one joogs, God annihilates the whole existing universe, and after a certain interval a new creation arises, to subsist seventy-one joogs more, and then to be annihilated in its turn. Thus they hold there have been almost an infinite number of worlds: but how many joogs have elapsed since the last creation they cannot certainly tell; only in an almanac written in the Sanscrit language in 1670.

the world is said to be then 3,892,771 years old from the last creation. The Siamese heaven is exactly the hell of some Socinians and other Christian writers; who, shocked with the horrible prospect of eternal torments, have taken refuge in the system of annihilation. It is countenanced, they say, by the words of Scripture; for death, destruction, and perishing, whereby the punishment of the wicked is most frequently expressed, do most properly import annihilation and an utter end of being. To this Tillotson answers, that these words, as well as those corresponding to them in other languages, are often used, both in Scripture and other writings, to signify a state of great misery and suffering, without the utter extinction of the miserable. Thus God is said in Scripture to bring destruction on a nation when he sends judgments upon them, but without exterminating or making an end of them. So in other languages it is frequent, by perishing, to express a person's being made miserable; as in that known passage in Tiberius's letter to the Roman senate: Ita me dii deæque omnes pejus perdant, quam hodie perire me sentio. As to the word death, a state of misery, which is as bad or worse than death, may properly enough be called by that name; and thus the punishment of wicked men after the day of judgment is, in the book of Revelations, frequently called the second death. Some Christian writers contend, that the most terrible torments will be inflicted hereafter on sinners for a long time, and after that suppose that there shall be an utter end of their being. Irenæus appears to have been of this opinion. But Tillemont, Petit, Didier, and others, endeavour to defend Irenæus from this imputation, as being too favourable to the wicked. It has been much disputed among divines, whether, at the consummation of all things, this earth is to be annihilated, or only purified and fitted for the habitation of some new order of beings. Gerard in his Common Places, and Hakewil in his Apology, contend earnestly for a total abolition or annihilation. Ray, Calmet, and others, think the system of renovation or restitution more probable, and more consonant to Scripture, reason, and infinite mercy. The fathers who have treated on the question are divided; some holding that the universe shall not be annihilated, but only its external face changed; others asserting that the substance of it shall be destroyed. The sentiments of mankind have differed very widely as to the possibility and impossibility of annihilation. According to some, nothing so difficult; it requires the infinite power of the Creator to effect it: some go further, and seem to put it out of the power of God himself! According to others, there is nothing so easy: existence is a state of violence; all things are continually endeavouring to return to their primitive nothing; annihilation requires no power at all; it will accomplish itself; nay, what is more, it requires an infinite power to prevent it. Many authors consider preservation a continual re-production of a thing, which, subsisting no longer of itself, would every moment return into nothing. Gassendi on the contrary asserts, that the world may indeed be annihilated by the same power which first created it, but that to continue it there is no occasion for any power of preservation. Some divines, of which number was the learned bishop King, hold annihilation for the greatest of all evils, worse than even the utmost torments of a future world; while others, with some of the eastern philosophers, consider it as the ultimate pitch of happiness! that sovereign good, that absolute beatitude, so long vainly sought for by the philosophers! The above prelate proposes it as a question, Whether suffering eternal torments be a greater evil than not existing? He thinks it highly probable that the heirs of future misery, while feeling their own torments in the most exquisite degree, will rather choose to be, and to be what they are, than not to be at all. Mr Bayle endeavours to refute him on this head; but might, one would think, have saved himself the trouble. 'Between the system of destruction and the system of eternal misery,' says the late Dr. Evans, in his popular Sketch of the Denomination of the Christian World, 'a middle hypothesis of the final destruction of the wicked (after having suffered the punishment due to their crimes) has been adopted more particularly by the Rev. Mr. Bourne, of Norwich; and Mr. John Marsom, in two small volumes, of which there has been a second edition with additions. They say that the Scripture positively asserts this doctrine of destruction; that the nature of future punishment (which the Scripture terms death) determines the meaning of the words everlasting, eternal, for ever, &c. as denoting endless duration; because no law ever did or can inflict the punishment of death for a limited period; that the punishment cannot be corrective, because no man was ever put to death either to convince his judgment or to reform his conduct; that if the wicked receive a punishment apportioned to their crimes, their deliverance is neither to be attributed to the mercy of God nor the mediation of Jesus Christ, but is an act of absolute justice; and, finally, that the mediatorial kingdom of Jesus Christ will never be delivered up, since the Scripture asserts that of his kingdom there shall be no end. Those who maintain these sentiments respecting the destruction of the wicked, are accused of espousing the doctrine of annihilation; but this accusation they repel, alleging that, philosophically speaking, there can be no annihilation, and that destruction is the express phrase used in the New Testament. O. this sentiment there have been many advocates distinguished for their erudition and piety.'

ANNI NUBILES, i.e. marriageable years, in law, denotes the marriageable age of a woman, viz. after she has arrived at twelve.

ANNIVER'SARY, *n.* & *adj.* } Lat. *annus*,
ANNIVERSAR'ILY, } a year, and
AN'NIVERSE. } *verto*, to turn.

Something done or observed every year at a certain time; returning with the revolution of the year.

——————Shall an *anniverse*
Be kept with ostentation to rehearse
A mortal prince's birth-day, or repeat
An eighty-eight or powder-plot's defeat?

Hale on Christmas Day.

The heaven whirled about with admirable celerity, most constantly finishing its *anniversary* vicissitudes. *Ray.*

They deny giving any worship to a creature, as inconsistent with Christianity; but confess the honour and esteem for the martyrs, which they expressed by keeping their *anniversary* days, and recommending their example. *Stillingfleet.*

ANNIUS of Viterbo, or John Nanni, a Dominican friar, born in 1432, and highly distinguished for his learning. He was made master of the sacred palace by pope Alexander VI., and died, as it was suspected, of poison, at the instigation of Cæsar Borgia in 1502. He is principally remarkable for his ingenuity as an impostor, having employed his leisure in the construction of fragments, which he palmed on the world as the remains of several ancient writers, in seventeen Books of Antiquities. The first edition of this work, dedicated to Ferdinand and Isabella, was printed at Rome in 1498, and in 1552 republished in 8vo. at Antwerp. The imposition passed for some time, and evinced great ability.

ANNO DOMINI, in chronology (abbreviated A.D.), the computation of time from the incarnation of our Saviour, which is used as the date for all public deeds and writings in England, on which account it is called the 'vulgar era.' It is generally allowed to be three years later than the real time of our Saviour's incarnation.

ANNOBON, a small island of Africa, on the coast of Loango, belonging to the Portuguese; it is about 300 miles west of Cape Lopez. According to Pyrard, it is about five or six French leagues in compass; but Bandrand says it is ten leagues round. Here are two high mountains, the tops of which being continually covered with clouds, occasion frequent rains. On the south-east of the island are two rocks; one of which is low, and upon a level with the surface of the sea, the other higher and larger; but both dangerous in the night to shipping; but between them the channel is deep and clear. These rocks are inhabited by vast numbers of tame birds. The inhabitants of Annobon are a mixed race of Portuguese and negroes. Lon. 5° 20′ E., lat. 1° 50° S.

ANNOISANCE, in law, the same as nuisance.

ANNONA, in antiquity; from annus, a year; signified properly a year's produce from land; but it is also taken for the provision of corn, and whatever else was necessary for the sustenance of man; hence annonæ caritas signifies dearness of provisions, or a dear market. Cic. in Verr. 3. c. 92, annona militaris, the public allowance of bread, fodder, &c.; and annonæ, in the plural, the loaves themselves. Lamprid. in Sever. c. 41.; Cod. Theodos. de Erag. Mil. Annon.

ANNONA, in botany, the custard-apple; a genus of the polygynia order and polyandria class of plants, ranking in the natural method under the fifty-second order, cordunatæ. The characters are: CAL. a triphylous perianthium: COR. six heart-shaped petals: STAM. having scarcely any filaments; antheræ numerous sitting on the receptaculum: PIST. a roundish germen; no styli; the stigmata obtuse and numerous: PERICARP. a large roundish unilocular berry, covered with a scaly bark: the SEEDS numerous. There are eight species; viz. 1. A. Africana, producing a smooth bluish kind of apple. 2. A. Asiatica, or purple apple, growing in Cuba in great plenty. The trees rise to the height of thirty feet or more. 3. A. cherimola, a native of Peru. 4. A. muricata, or sour-sop, rarely rising above twenty feet high, but well furnished with branches. 5. A. palustris, or water-apple. 6. A. reticulata, or custard-apple, a native of the West Indies. 7. A. squamosa, or sweet-sop, seldom higher than fifteen feet. 8. A. triloba, or North American annona, a native of the Bahama Islands, called by the inhabitants papaw.

ANNONÆ PRÆFECTUS, in Roman antiquity, an extraordinary magistrate, whose business it was to prevent a scarcity of provision, and to regulate the weight and fineness of bread.

ANNONÆ STRUCTOR, the steward of the military provisions among the ancient Romans.

ANNONAGE, ANNONAGIUM, a tax on corn.

ANNONARIUS, in Roman antiquity, the distributor of provisions among the soldiers; also a monopolist.

ANNONCE, in music, an introductory prelude to a plain chant, or psalm.

ANNONAY, a town of France, the head of a canton in the arrondissement of Tournon. It is seated at the confluence of the Cauce and Deume, twelve miles south-west of Vienne, and was formerly the capital of the Upper Vivarois, in Lower Languedoc. A great paper manufacture is carried on in this town, which is famed for being the place where M. Montgolfier, the proprietor, first launched his air balloons. See AERONAUTICS. Beside the paper-works here, are also extensive manufactures of silk, leather, and dye-stuff. The town was in the sixteenth century the scene of frequent conflict between the Catholics and Protestants, but they now live very harmoniously together. Population about 5800.

ANNONÉ, a fort and town of Italy, belonging to Montferrat, on the borders of the Milanese; seated on the Tanaro, nine miles east from Asti.

ANNOT, a small town of France, in the department of the Lower Alps, the head of a canton, and contains about 1000 inhabitants.

ANNOTATING, *v.* } Ad, *noto;* supposed
ANNOTA'TOR, } by Vossius to be deriv-
ANNOTA'TION, } ed from *notum*, the su-
ANNOTA'TIONIST. } pine of *nosco*, to know.

To make notes, marks, or observations.

At length hee, M. Tyndall, beethought hymselfe of Cutbert Tunstall then Byshop of London, and especially for the great commendatiō of Erasmus, who in his *annotations* so extolleth him for his learning. *The Whole Workes of Wm. Tyndall, &c.*

Henry Savile carefully collected the best copies of books written by St. Chrysostom, from various parts of the world, and employed learned men to transcribe and make *annotations* on them.

Wood's Athenæ Oxonienses.

It might appear very improper to publish *annotations*, without the text itself whereunto they relate. *Boyle.*

I have not that respect for the *annotators* which they generally meet with in the world.

Felton on the Classics.

ANNOTATION, in civil law, denotes a kind of rescript or grant of the emperor, signed with his own hand. It took its name from the note

or subscription at the bottom, which was in red letters.

ANNOTATION, in medicine, is the first beginning of a febrile paroxysm, when the patient grows chill, shudders, yawns, is drowsy, and the like.

ANNOTO, a river of Jamaica, flowing into a bay of the same name, on the north side of the island, between the mouths of the Blowing and Palmito.

ANNOTTO, in botany and dyeing, the pellicles of the seeds of the bixa orellana, a cilicious shrub, from fifteen to twenty feet high, brought into Europe in red masses under the names of Annotto, Orlean, and Roucou. As commonly met with, it is moderately hard, of a brown colour on the outside, and a dull red within. It is with difficulty acted upon by water, and tinges the liquor only of a pale brownish-yellow colour. In rectified spirit of wine it very readily dissolves, and communicates a high orange or yellowish-red. Hence it is used as an ingredient in varnishes, for giving more or less of an orange cast to the simple yellows. Alkaline salt renders it perfectly soluble in boiling water, without altering its colour. It is used for colouring cheese.

ANNOUNCE', *v.* ANNUN'CIATE, ANNUNCIA'TION. *Annuncio; ad, nuncio;* to bring news to. To make known, to inform, to declare publicly, to proclaim.

Lo Sampson, which that was *annunciat*,
By the angel, long or his nativitee:
And was to God Almighty consecrat,
And stode in noblesse while he mighte see.
Chaucer. The Monke's Tale, vol. ii. p. 139.

Those, mighty Jove, mean time, thy glorious care,
Who model nations, publish laws, *announce*
Or life or death; and found or change the empire.
Prior. Hymn of Callimachus.

Of the Messiah I have heard foretold
By all the prophets; of thy birth at length
Announced by Gabriel with the first I knew.
Milton.

We might with as much reason doubt whether the sun was intended to enlighten the earth, as whether he who has framed the human mind intended to *announce* righteousness to mankind as a law. *Blair.*

ANNOY', *v.* & *n.* ANNOY'ANCE, ANNOY'FUL, ANNOY'OUS. Derived by successive corruptions, and through various mediums, from the Latin *nocere*, to hurt. To hurt, harm, vex, discompose.

And þe Romaynes beþ *anyed* of here trauail so sore,
Of perel on se, & eke on lond, þat heo nul come her no more. *R. Gloucester*, p. 100.

But certes ye han sodeinly cleped to your conseil, a gret multitude of peple ful chargeant & ful *anoyous* for to here.
Chaucer. Tale of Mœlibœus, vol. ii. p. 94.

But the cheer of the Lord is on men that douen yuelis, and who is it that schal *anoye* you if ye ben soureis and loureis of goodnesse.
Wiclif. Peter i. c. 3.

Then is your careless courage accoy'd,
Your careful herds with cold be *annoy'd*.
Spenser. Shep. Kal. Feb. 47.

No other noise, nor people's troublous cries,
As still are wont to *annoy* the walled town,
Might there be heard; but careless quiet lies
Wrapt in eternal silence far from enemies.
Spenser.

Nothing is so sovereign which being prevented may not *annoy* instead of benefiting us.
Hall's Contemplations.

Sleep, Richmond, sleep in peace, and wake in joy;
Good angels guard thee from the boar's *annoy*.
Shakspeare.

All pain and joy is in their way;
The things we fear bring less *annoy*
Than fear, and hope brings greater joy;
But in themselves they cannot stay.
Donne.

What then remains, but, after past *annoy*,
To take the good vicissitude of joy? *Dryden.*

Nor stood unmindful Abdiel to *annoy*
The atheist crew, but with redoubled blow
Ariel and Arioch, and the violence
Of Ramiel, scorch'd and blasted overthrew.
Milton.

Where houses thick, and sewers, *annoy* the air,
Forth issuing on a summer's morn to breathe
Among the pleasant villages and farms
Adjoin'd, from each thing met conceives delight.
Id.

Crows, ravens, rooks, and magpies, are great *annoyances* to corn. *Mortimer.*

From labour health, from health contentment springs:
Contentment opes the source of every joy.
He envied not, he never thought of kings,
Nor from those appetites sustained *annoy*.
Beattie's Minstrel

O shun the *annoyance* of the bustling throng,
That haunt with zealous turbulence the great;
There coward Office boasts unpunish'd wrong,
And sneaks secure in insolence of state. *Id.*

ANNUA PENSIONE, a writ formerly issued from the king to an abbot or prior, demanding an annual pension due for his chaplains.

AN'NUAL, *n.* & *adj.* AN'NUALLY, AN'NUARY, ANNU'ITANT, ANNU'ITY, ANNU'ELLER. *Annuus*, from *annus*, a year. Yearly, happening every year: Annual sometimes signifies that which lasts only a year, particularly applied to plants which do not generally live more than a year.

There must be masses, dyrges, ther muste be *annuaries* bead mē.
Bale's Image of both Churches, p. 91.

Get all the town to help that will be hired,
Their pains I'll turn to *annual* holiday,
If it shall chance, but one bring word of her.
Beau. and Fletch. Love's Pilgrimage, act v.

The dying in the winter of the roots of plants that are *annual*, seemeth to be caused by the over-expence of the sap; which being prevented, they will superannuate if they stand warm. *Bacon.*

Every year may in some sense be said to be an *annual* plant; both leaf, flower, and fruit proceeding from the coat, that was superinduced over the wood the last year. *Ray.*

He was generally known to be the son of one earl and brother to another; who supplied his expence beyond what his *annuity* from his father would bear.
Clarendon.

By two drachms they thought it sufficient to signify a heart; because the heart at one year weighs two drachms, that is, a quarter of an ounce; and unto fifty years *annually* encreaseth the weight of one drachm. *Brown's Vulgar Errours.*

Ere the progressive course of restless age
Performs three thousand times its *annual* [illegible]

May not our power and learning be suppressed,
And hearts and empire learn to travel west.
Prior's Solomon, book i.

The whole strength of a nation is the utmost that a prince can raise *annually* from his subjects.
Swift.

——— Supply anew
With *annuary* cloaks the wand'ring Jew.
John Hall's Poems.

An *annuity* is a thing very distinct from a rent-charge, with which it is frequently confounded: a rent-charge being a burden imposed upon and issuing out of lands; whereas an *annuity* is a yearly sum chargeable only upon the person of the grantor.
Blackstone's Commentaries.

ANNUAL PLANTS, in botany, or simply annuals, are such as only come up in spring, and die in autumn; and therefore must be renewed every year.

ANNUAL RENT is used, in Scots law, to denote the interest due for a sum of money to a creditor, and was the original method of burdening lands with a yearly payment for the loan of money, before the taking of interest was allowed by statute.

ANNUALIA, in ecclesiastical affairs, 1. Yearly oblations anciently made by the relations of deceased persons on the day of their death, and on which mass was celebrated with great solemnity: 2. The priest's salary for celebrating mass annually.

ANNUEL OF NORWAY, of which mention is made in the acts of parliament of king James III. was an annual payment of 100 marks sterling, which the kings of Scotland were obliged to pay to Norway. It was first established in 1266; in consideration whereof the Norwegians renounced all title to the succession of the isles of Scotland, and paid till the year 1468, when, with all its arrears, it was renounced in the contract of marriage between king James III. and Margaret daughter of Christian I. king of Norway, Denmark, and Sweden.

ANNUENTES MUSCULI; from *annuere*, to nod, in anatomy; a pair of transverse muscles at the root of the vertebræ of the back, called also recti interni minores.

ANNUITIES.

ANNUITIES, if in strict propriety of language they cannot be called a science, being only a branch of practical arithmetic, or rather of algebra, founded upon probabilities drawn from facts, yet are of such acknowledged importance in the present state of society, entering largely into our habits as a commercial, and our happiness as a domestic, nation, that they have employed the pens of many eminent calculators, and have been treated of in connection with the purest sciences.

DEFINITION AND DIVISIONS OF ANNUITIES.

Annuities imply any periodical income, arising from money lent, or from houses, lands, salaries, pensions, &c. payable from time to time, either annually, or at other intervals of time. They may be divided into such as are *certain*, and such as depend on some *contingency*, as the continuance of a life, &c. Annuities are also divided into annuities in *possession*, and annuities in *reversion*; the former meaning such as have commenced; and the latter such as will not commence till some particular event has occurred, or till some given period of time has elapsed. Annuities may be farther considered as payable yearly, or half-yearly, or quarterly, &c. And annuities may be supposed to be *improved*, either in the way of simple, or compound interest. The last of these hypotheses, being the most equitable both for seller and buyer, is commonly assumed. But the most general and important division of this subject is into annuities *certain* or *contingent*: and the latter has been applied principally to the contingency of *life*: we therefore treat in this article of *certain annuities*, and refer the reader forward to ASSURANCE and to LIFE ANNUITIES for the treatment of all those parts of this subject which rest on contingencies.

On the subject of certain annuities let the reader bear in mind the following preliminary data:—

If the rate is 5 per cent., £1 improved at simple interest during one year, will amount to £1·05; and the same sum in the second year will be augmented in the same ratio of 1 to 1·05; the amount then will therefore be $1{\cdot}05 \times 1{\cdot}05$, or $(1{\cdot}05)^2 = 1{\cdot}1025$. In this manner it appears that the last amount, improved at interest during the third year, will be increased to $(1{\cdot}05)^3 = 1{\cdot}157623$; the fourth year it will be $(1{\cdot}05)^4$; the fifth $(1.05)^5$, and so on; the amount at the end of any number of years being always determined, by raising the number which expresses the amount at the end of the first year, to the power of which the exponent is the number of years. So that when the rate of interest is 5 per cent., £1 improved at compound interest, will in seven years, amount to $(1{\cdot}05)^7$, and in twenty-one years to $(1{\cdot}05)^{21}$. But if the rate of interest were only 3 per cent., these amounts would only be $(1.03)^7$, and $(1{\cdot}03)^{21}$ respectively.

The present value of £1. to be received certainly at the end of any assigned term, is such a less sum, as, being improved at compound interest during the term, will just amount to one pound. It must therefore be less than £1, in the same ratio as £1 is less than its amount in that time; but in three years, at 5 per cent., £1. will amount to $£(1{\cdot}05)^3$ (1). And $(1{\cdot}05)^3 : 1 :: 1 : \frac{1}{(1.05)^3}$; so that $\frac{1}{(1.05)^3} = \frac{1}{1{\cdot}157625} = 0{\cdot}863838$ is the present value of £1 to be received at the expiration of three years.

In the same manner it appears that, at 4 per cent. interest, the present value of £1 to be received at the end of a year, is $\frac{1}{1{\cdot}04} = 0{\cdot}961538$;

and if it were not to be received until the expiration of twenty-one years, its present value would be $\frac{1}{(1{\cdot}04)^{21}} = (0{\cdot}961538)^{21} = 0{\cdot}438834$.

Hence it appears, that if unity be divided by the amount of £1, improved at compound interest during any number of years, the quotient will be the present value of £1 to be received at the expiration of the term; which may also be obtained by raising the number which expresses the present value of £1 receivable at the expiration of a year, to the power of which the exponent is the number of years in the term.

When a certain sum of money is receivable annually, it is called an annuity, and its quantum is expressed by saying it is an annuity of so much; thus, according as the annual payment is £1, £10, or £100, it is called an annuity of £1, of £10, or of £100. And when the annual payment does not depend upon any contingent event, but is to be made certainly, either in perpetuity or during any assigned term, it is called an annuity certain. In calculating the value of an annuity, the first payment is always considered to be made at the end of the first year from the time of the valuation, unless the contrary be expressly stated.

The whole number, and part or parts of one annual payment of an annuity, which all the future payments are worth in present money, is called the number of years purchase, the annuity is worth; and, being the sum of the present values of all the future payments, is also the sum which, being put out and improved at compound interest, will just suffice for the payment of the annuity. Hence it follows, that when the annuity is £1, the number of years purchase and parts of a year is the same as the number of pounds and parts of a pound in its present value.

If each payment of an annuity of £1 could be put out as it becomes due, and improved at compound interest during the remainder of the term, it is evident that at the expiration of the term, the payment then due will be but £1, having received no improvement at interest. That received one year before will be augmented to the amount of £1 in a year; that received two years before will be augmented to the amount of £1 in two years; that received three years before to the amount of £1 in three years, and so on until the first payment, which will be augmented to the amount of £1 in a term one year less than that of the annuity.

The excess of an annuity certain above the interest of the purchase-money, is the sum which, being put out at the time of each payment becoming due, and improved at compound interest until the expiration of the term, will just amount to the purchase-money originally paid. But, while everything thing else remains the same, the longer the term of the annuity is, the less must its excess above the interest of the purchase-money be, because a less annuity will suffice for raising the same sum within the term. Therefore, the proportion of that excess to the annual interest of the purchase-money, continually diminishes as the term is extended; and when the annuity is a perpetuity, there is no such excess.

The reason why the value of an annuity is increased by that and the interest being both payable more than once in the year, is, that the grantor loses, and the purchaser gains, the interest produced by that part of each payment, which is in excess above the interest then due upon the purchase-money, from the time of such payment being made, until the expiration of the year. Hence it is obvious, that the less this excess is, that is, the longer the term of the annuity is, the less must the increase of value be.

And when the annuity is a perpetuity, its value will be the same, whether it and the interest of money be both payable several times in the year, or once only. When the annuity is not payable at the same intervals at which the interest is convertible into principal, its value will depend upon the frequencies both of payment and conversion; but its investigation without algebra would be too long, and of too little use, to be worth prosecuting here

Of Annuities Certain.

The present value of an annuity, is that sum, which, being improved at interest, will be sufficient to pay the annuity. The present value of an annuity certain, payable yearly, is calculated in the following manner: Let the annuity be 1, and let r denote the amount of £1 for a year, or £1 increased by its interest for one year. Then, 1 being the present value of the sum r, and having to find the present value of the sum 1, it will be, by proportion thus, $r : 1 :: 1 : \frac{1}{r}$ the present value of £1 due a year hence. In like manner, $\frac{1}{r^2}$ will be the present value of £1 due two years hence; for $r : 1 :: \frac{1}{r} : \frac{1}{r^2}$. In like manner, $\frac{1}{r^3}$, $\frac{1}{r^4}$, $\frac{1}{r^5}$, &c. will be the present value of £1 due at the end of 3, 4, 5, &c. years respectively; and in general, $\frac{1}{r^n}$ will be the value of £1 to be received after the expiration of n years. Consequently the sum of all these, or $\frac{1}{r} + \frac{1}{r^2} + \frac{1}{r^3} + \frac{1}{r^4}$ + &c. continued to n terms, will be the present value of all the n years annuities. And the value of the perpetuity is the sum of the series continued ad infinitum.

But this series, it is evident, is a geometrical progression, whose first term and common ratio are each $\frac{1}{r}$, and the number of its terms n; and therefore the sum s of all the terms, or the present value of all the annual payments, will be $s = \frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n}$.

When the annuity is a perpetuity, it is plain that the last term $\frac{1}{r^n}$ vanishes, and therefore $\frac{1}{r-1} \times \frac{1}{r^n}$ also vanishes; and consequently the expression becomes barely $s = \frac{1}{r-1}$; that is

any annuity divided by the interest of £1 for one year, is the value of the perpetuity.

If the annuity is not to be entered on immediately, but after a certain number of years, as m years; then the present value of the reversion is equal to the difference between two present values, the one for the first term of m years, and the other for the end of the last term n; that is, equal to the difference between $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n}$ and $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^m}$, or $= \frac{1}{r-1} \times \left(\frac{1}{r^m} - \frac{1}{r^n}\right)$. Hence also the present worth of perpetuity in reversion, of £1 to commence after m years, is, $\frac{1}{r-1} \times \frac{1}{r^m}$.

Annuities certain differ in value as they are made payable yearly, half-yearly, or quarterly.—And by proceeding as above, using the interest or amount of a half-year, or a quarter, as those for the whole year were used, the following set of theorems will arise: where r denotes, as before, the amount of £1 and its interest for a year, and n the number of years, during which any annuity is to be paid; also P denotes the perpetuity $\frac{1}{r-1}$, Y denotes $\frac{1}{r-1} - \frac{1}{r-1} \times \frac{1}{r^n}$ the value of the annuity supposed payable yearly, H the value of the same when it is payable half-yearly, and Q the value when payable quarterly; or universally: M the value when it is payable every m part of a year.

Theorem 1. $Y = P - P \times (\frac{1}{r})^n$.

Theorem 2. $H = P - P \times (\frac{2}{r+1})^{2n}$.

Theorem 3. $Q = P - P \times (\frac{1}{r+1})^{4n}$.

Theorem 4. $M = P - P \times (\frac{m}{r+m-1})^{mn}$.

EXAMPLE.

Let the rate of interest be 4 per cent. and the term 5 years; and consequently $r = 1{\cdot}04$, $n = 5$, $P = 25$; and also let $m = 12$, or the interest payable monthly in theorem 4; then the present value of such annuity of £1 a-year, for 5 years, according as it is supposed payable £1 yearly, or one-half of a pound every half-year, or one-fourth of a pound every quarter, or one-twelfth of a pound every month, or one-twelfth part of a year, will be as follows:—

$Y = 25 - 25 \times {\cdot}821928 = 4{\cdot}4518$
$H = 25 - 25 \times {\cdot}820248 = 4{\cdot}4913$
$Q = 25 - 25 \times {\cdot}819543 = 4{\cdot}5114$
$M = 25 - 25 \times {\cdot}818996 = 4{\cdot}5251$

Annuities may be considered as in arrears, or as forborne for any number of years; in which case each payment is to be considered as a sum put out to interest for the remainder of the term after the time it becomes due. And as £1 due at the end of one year amounts to r at the end ot another year, and to r^2 at the end of the third year, and to r^3 at the end of the fourth year, and so on; therefore, by adding always the last year's annuity, or 1, to the amounts of all the former years, the sum of all the annuities and their interests will be the sum of the following geometrical series, $1 + r + r^2 + r^3 + r^4 \ldots\ldots$ to r^{n-1}, continued till the last term be r^{n-1}, or till the number of terms be n, the number of years the annuity is forborne. But the sum of this geometrical progression is $\frac{r^n - 1}{r-1}$ which therefore is the amount of £1 annuity forborne for n years. And this quantity being multiplied by any other annuity a, instead of 1, will produce the amount of that other annuity.

TABLE I.

AMOUNT OF AN ANNUITY OF 1*l.* AT COMPOUND INTEREST.

Yrs.	at 3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
1	1·00000	1·00000	1·00000	1·00000	1·00000	1·00000
2	2·03000	2·03500	2·04000	2·04500	2·05000	2·06000
3	3·09090	3·10623	3·12160	3·13703	3·15250	3·18360
4	4·18363	4·01494	4·24646	4·27819	4·31013	4·37462
5	5·30914	5·36247	5·41632	5·47071	5·52563	5.63709
6	6·46841	6·55015	6·63298	6·71689	6·80191	6·97532
7	7·66246	7·77941	7·89829	8·01915	8·14201	8·39384
8	8·89234	9·05169	9·21423	9·38001	9·54911	9·89747
9	10·15911	10·36850	10·58280	10·80211	11·02656	11·49132
10	11·46388	11·73139	12·00611	12·28821	12·57789	13·18079
11	12·80780	13·14199	13·48635	13·84118	14·20679	14·97164
12	14·19203	14·60196	15·02581	15·46403	15·91713	16·86994
13	15·61779	16·11303	16·62684	17·15991	17·71298	18·88214
14	17·08632	17·67699	18·29191	18·93211	19·59863	21·01507
15	18·59891	19·29568	20·02359	20·78405	21·57856	23·27597
16	20·15688	20·97103	21·82453	22·71934	23·65749	25·67253
17	21·76159	22·70502	23·69751	24·74171	25·84037	28·21288
18	23·41444	24·49969	25·64541	26·85508	28·13138	30·90565
19	25·11687	26·35718	27·61123	29·06358	30·53900	33·75999
20	26·87037	28·27968	29·77808	31·37143	33·06595	36·78559

TABLE I.—*Continued.*

Yrs.	at 3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
21	28·67649	30·26947	31·96920	33·78314	35·71925	39·99273
22	30·53678	32·32890	34·24797	36·30338	38·50521	43·39229
23	32·45288	34·46041	36·61789	38·93703	41·43048	46·99583
24	34·42647	36·66653	39·08260	41·68920	44·50200	50·81558
25	36·45926	38·94986	41·64591	44·56521	47·72710	54·86541
26	38·55304	41·31310	44·31174	47·57464	51·11345	59·15638
27	40·70963	43·75906	47·08421	50·71132	54·66913	63·70577
28	42·93092	46·29063	49·96758	53·99333	58·40258	68·52811
29	45·21885	48·91080	52·96629	57·42303	62·32271	73·63980
30	47·57542	51·62268	56·98494	61·00707	66·43885	79·05819
31	50·00268	54·42947	59·32834	64.75239	70·76079	84·80168
32	52·50276	57·33450	62·70147	68·66625	75·29883	90·88978
33	55·07784	60·34121	66·20953	72·75623	80·06377	97·34316
34	57·73018	63·45315	69·85791	77·03026	85·06696	104·18375
35	50·46208	66·67401	73·65222	81·49662	90·32031	111·43478
36	63·27594	70·00760	77·59831	86·16397	95·83632	119·12087
37	66·17422	73·45787	81·70225	91·04134	101·62814	127·26812
38	69·15945	77·02889	85·97034	96·13820	107·70955	135·90421
39	72·23423	80·72491	90·40915	101·46442	114·09502	145·05846
40	75·40126	84·55028	95·02552	107·03032	120·79977	154·76197
41	78·66330	88·50954	99.82654	112·84669	127·83976	165·04768
42	82·02320	92·60737	104·81960	118·92479	135·23175	175·95054
43	85·48389	96·84863	110·01238	125·27640	142·99334	187·50758
44	89·04841	101·23833	115·41288	131·91384	151·14301	199·75803
45	92.71986	105.78167	121·02939	138·84997	159·70016	212.74351
46	96·50146	110·48403	126·87057	146·09821	168·68516	226·50812
47	100·39650	115·35097	132·94539	153·67263	178·11942	241·09861
48	104·40840	120·38326	139·26321	161·58790	188·02539	256·56453
49	108·54065	125·60185	145·83373	169·85936	198·42666	272·95840
50	112·79689	130·99791	152·66708	178·50303	209·34800	290·33590
51	117·18077	136·58284	159·77377	187·53566	220·81540	308·75606
52	121·69620	142·36324	167·16472	196·97477	232·85617	328·28142
53	126·34708	148·34595	174·85131	206·83863	245·49897	348·97831
54	131·13750	154·53806	182·84236	217·14637	258·77392	370·91701

TABLE II.

THE PRESENT VALUE OF AN ANNUITY OF 1*l*.

Yrs.	at 3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
1	0·97087	0·96618	0·96154	0·95694	0·95238	0·94340
2	1·91347	1·89966	1·88610	1·87267	1·85941	1·83339
3	2·88861	2·80164	2·77059	2·74896	2·72325	2·67301
4	3·71710	3·67308	3·62990	3·58753	3·54595	3·46511
5	4·57971	4·51505	4·45182	4·38998	4·32948	42·1236
6	5·41719	5·32855	5·24214	5·15787	5·07569	4·91732
7	6·23028	6·11454	6·00205	5·89270	5·78637	5·58238
8	7·01969	6·87396	6·73274	6·59589	6·46321	6·20979
9	7·78611	7·60769	7·43533	7·26879	7·10782	6·80169
10	8·53020	8·31661	8·11090	7·91272	7·72173	7·36009
11	9·25262	9·00155	8·76048	8·52892	8·30541	7·88687
12	9·95400	9·66333	9·38507	9·11858	8·86325	8·38384
13	10·65596	10·30274	9·98565	9·68285	9·39357	8·85268
14	11·29607	10·92052	10·56312	10·22283	9·89864	9·29498
15	11·93794	11·51741	11·11839	10·73955	10·37966	9·71225

TABLE II.—*Continued.*

Yrs.	at 3 per cent.	3½ per cent.	4 per cent.	4½ per cent.	5 per cent.	6 per cent.
16	12·56110	12 09411	11·65230	11·23402	10·83777	10·10590
17	13·16612	12·65132	12·16567	11·70719	11·27407	10·47726
18	13·75351	13.18968	12·65930	12·15999	11·68959	10·82761
19	14.32380	13·70984	13·13394	12·59329	12·08532	11·15812
20	14·87747	14.21240	13·59033	13·00794	12·46221	11·46992
21	15·41502	14·69797	14·02916	13·40472	12·82115	11·79498
22	15·93692	15·16712	14·45112	13·78442	13·16300	12·04158
23	16·44361	15·62041	14·85684	14·14777	13·48857	12·30338
24	16·93554	16.05837	15·24696	14·49548	13·79864	12·55040
25	17·41315	16.48151	15·62208	14·82821	14·02394	12·78336
26	17·87683	16.89035	15·98277	15·14661	14·37519	13·00317
27	18·32703	17·28536	16·32959	15·45130	14·64303	13·21053
28	18·76411	17·66702	16·66306	15·74287	14·89813	13·40616
29	19·18845	18·03577	16·98371	16·02182	15·14107	13·59072
30	19·60044	18·29205	17·29203	16·28889	15·37245	13·76483
31	20·00043	18·73628	17·58849	16·54439	15·59281	13·92909
32	20·38877	19·06887	17·87355	16·78889	15·80268	14·08484
33	20·76579	19·39021	18·14765	17·02266	16·00255	14·23023
34	21·13184	19·70068	18 41120	17·24676	16·19290	14·36814
35	21·48722	20·00066	18·66461	17·46101	16·37419	14·49825
36	21·83225	20·29049	19·90828	17·66604	16·54685	14·62099
37	22·16724	20·57053	19·14258	17·86224	16·71129	14.73678
38	22.49246	20·84109	19·36786	18·04999	16·86789	14·84602
39	22·80822	21·10250	19·58448	18·22966	17·01704	14·94907
40	23.11477	21·35507	19.79277	18·40158	17·15909	15·04639
41	23·41240	21·59910	19·99305	18·56611	17·29437	15·13802
42	23·70136	21·83488	20·18563	18·72355	17·42321	15·22454
43	23·98190	22·06269	20'37079	18·87421	17·54591	15·30617
44	24·25427	22·28279	20·54884	19·01838	17 66277	15·38318
45	24·51871	22·49545	20·72004	19·15635	17·77407	15·45583
46	24·77545	22·70092	20·88465	19·28837	17·88907	15·52437
47	25·02471	22·89944	21·04294	19·41471	17·98102	15·58903
48	25·26672	23·09124	21·19513	19·53561	18·07716	15·65003
49	25·50166	23·27656	21·34147	19·65130	18·16872	15·70757
50	25·72976	23·45562	21·48218	19·76201	18·25593	15·76186
51	25·95123	23·62862	21·61749	19·86795	18·33898	15·81308
52	26·16624	23·79576	21·74758	19·96933	18·41807	15·86139
53	26·37499	23·95726	21·87267	20·06634	18·49340	15·90697
54	26·57766	24.11330	21·99296	20·15918	18·56515	15·94998

THE USE OF TABLE I.

To find the amount of an annuity forborne any number of years.

Take out the amount from the first table, for the proposed years and rate of interest; then multiply it by the annuity in question, and the product will be its amount for the same number of years, and rate of interest.

And the converse to find the rate of time.

Examp. 1.—*To find how much an annuity of* £50 *will amount to in twenty years at* 3½ *per cent. compound interest.*

On the line of twenty years, and in the column of three and a half per cent. stands 28·27968, which is the amount of an annuity of £1 for the twenty years; and therefore 28·27968 multiplied by 50, gives 1413·984*l.*, or £1413 19*s.* 8*d.* for the answer.

Examp. 2.—*In what time will an annuity of* £20 *amount to* £1000 *at four per cent. compound interest?*

Here the amount of £1000, divided £20 the annuity, gives fifty, the amount of £1 annuity for the same time and rate. Then the nearest tabular

number in the column of four per cent. is 49·96758, which standing on the line of twenty-eight, shows that twenty-eight years is the answer.

Examp. 3.—*Required to find at what rate of interest an annuity of* £20 *will amount to* £1000, *forborne for twenty-eight years.*

Here 1000 divided by twenty gives fifty as before. Then looking along the line of twenty-eight years for the nearest to this number fifty, I find 49·96758 in the column of four per cent. which is therefore the rate of interest required.

The Use of Table II.

Examp. 1.—*To find the present value of an annuity of* £50 *which is to continue twenty years at three and a half per cent.*

By the table the present value of £1. for the same rate and time is 14·21240; therefore, 14·21240 × 50 = 710·62*l.*, or £710. 12*s.* 4*d.* is the present value sought.

Examp. 2.—*To find the present value of an annuity of* £20 *to commence twenty years hence; and then to continue for forty years, or to terminate fifty years hence, at four per cent interest.*

In such cases as this, it is plain we have to find the difference between the present values of two equal annuities for the two given times; which therefore will be effected by subtracting the tabular value of the one term from that of the other, and multiplying by the annuity. Thus,

tabular value for 50 years	21·48218
tabular value for 10 years	8·11090
the difference	13·37128
multiplied by	20
gives	267·4256

or £267. 8*s.* 6*d.* the answer.

To the docrine of certain annuities it does not appear that any material additions can be made. The best modern writings on the subject are, unquestionably, those of Mr. Milne and Mr. Bailey.

Annuities, Government. Borrowing upon annuities is one of the methods employed by civilised governments for raising supplies. Of this there are two methods; that of borrowing upon annuities for terms of years, and that of borrowing upon annuities for lives. During the reign of king William and queen Anne, large sums were frequently borrowed upon annuities for terms of years, which were sometimes longer and sometimes shorter. In 1693 an act was passed for borrowing one million upon an annuity of fourteen per cent., or £140,000 a year for sixteen years. In 1691 an act was passed for borrowing a million upon annuities for lives, upon terms which in the present times would appear very advantageous. But the subscription was not filled up. In the following year the deficiency was made good by borrowing upon annuities for lives at fourteen per cent. or at little more than seven years' purchase. In 1695, the persons who had purchased these annuities were allowed to exchange them for others of ninety-six years, upon paying into the exchequer sixty-three pounds in the hundred, that is, the difference of fourteen per cent. for life, and fourteen per cent. for ninety-six years, was sold for sixty-three pounds, or four years' and a half purchase. Such was the supposed instability of government, that even these terms procured few purchasers. In the reign of queen Anne, money was upon different occasions borrowed both upon annuities for lives and upon annuities for terms of thirty-two, of eighty-nine, of ninety-eight, and of ninety-nine years. In 1719 the proprietors of annuities for thirty-two years were induced to accept in lieu of them South Sea stock to the amount of seven and a half years' purchase of the annuities, together with an additional quantity of stock equal to the arrears which happened then to be due upon them. In 1720 the greater part of the other annuities for terms of years both long and short were subscribed into the same fund. The long annuities at that time amounted to £666,421. 8*s.* 3½*d.* a year. On the 5th of January, 1775, the remainder of them, or what was not subscribed at that time, amounted only to £136,153. 12*s.* 8*d.* During the two wars which began in 1739, and in 1755, little money was borrowed either upon annuities for terms of years, or upon those for lives. An annuity for ninety-eight or ninety-nine years, however, is worth nearly as much money as a perpetuity, and should, therefore, one might think, be a fund for borrowing as much. But those who, in order to make family settlements, and to provide for remote futurity, buy into the public stocks, would not care to purchase into one of which the value was continually diminishing; and such people make a considerable proportion both of the proprietors and purchasers of stock. An annuity for a long term of years therefore, though its intrinsic value may be very nearly the same with that of a perpetual annuity, will not find nearly the same number of purchasers. The subscribers to a new loan, who mean generally to sell their subscription as soon as possible, prefer greatly a perpetual annuity redeemable by parliament, to an irredeemable annuity for a long term of years of only equal amount. The value of the former may be supposed always the same, or very nearly the same; and it makes, therefore, a more convenient transferable stock than the latter. During the two last-mentioned wars, annuities, either for terms of years or for lives, were seldom granted but as premiums to the subscribers to a new loan, over and above the redeemable annuity or interest upon the credit of which the loan was supposed to be made. They were granted, not as the proper fund upon which the money was borrowed, but as an additional encouragement to the lender. Annuities for lives have occasionally been granted in two different ways; either upon separate lives, or upon lots of lives, which in French are called Tontines, from the name of their inventor. When annuities are granted upon separate lives, the death of every individual annuitant disburdens the public revenue so far as it was affected by his annuity. When annuities are granted upon tontines, the liberation of the public revenue does not commence till the death of all the annuitants comprehended in one

lot, which may sometimes consist of twenty or thirty persons, of whom the survivors succeed to the annuities of all those who die before them; the last survivor succeeding to the annuities of the whole lot. Upon the same revenue more money can be raised by tontines than by annuities for separate lives. An annuity with a right of survivorship, is really worth more than an equal annuity for a separate life; and from the confidence which every man naturally has in his own good fortune, the principle upon which is founded the success of all lotteries, such an annuity generally sells for something more that it is worth. In countries where it is usual for government to raise money by granting annuities, tontines are upon this account generally preferred to annuities for separate lives. The expedient which will raise most money, is almost always preferred to that which is likely to bring in the speediest manner the liberation of the public revenue. In France, before the late revolution, a much greater proportion of the public debts consisted in annuities for lives than in England. According to a memoir presented by the parliament of Bourdeaux to the king in 1764, the whole public debt of France was estimated at 2400 million of livres; of which the capital, (for which annuities for lives has been granted,) was supposed to amount to 300 millions, the eighth part of the whole public debt. The annuities themselves were computed to amount to thirty millions a year, the fourth part of 120 millions, the supposed interest of the whole debt. It was not the different degrees of anxiety in the two governments of France and England for the liberation of the revenue, which occasioned this difference in their respective modes of borrowing; it arose altogether from the different views and interests of the lenders. In the former, the money-lenders were, in general, either court bankers, farmers general, or tax gatherers, who, from a mean origin, had arisen to great riches, and who, being too proud to marry their equals or inferiors, were despised by those haughty nobless, who considered themselves as their superiors, and therefore resolved to live bachelors. To such persons who had no prospect of, or care for, posterity, nothing was more convenient than to exchange their capital for a revenue that would last just as long and no longer than they wished. But in Great Britain, the seat of government being the greatest mercantile city in the world, the merchants are generally the people who advance money to government. By advancing it they do not mean to diminish, but on the contrary, to increase, their mercantile capitals; and unless they expected to sell with some profit their share in the subscription for a new loan, they never would subscribe. But if by advancing their money they were to purchase, instead of perpetual annuities, annuities for lives only, whether their own or those of other people, they would not always be so likely to sell them with a profit. Annuities upon their own lives they would always sell with loss, because no man will give for an annuity upon the life of another whose age and state are the same with his own, the same price which he would give for one upon his own. An annuity upon the life of a third person, indeed, is, no doubt, of equal value to the buyer and the seller; but its real value begins to diminish from the moment it is granted, and continues to do so more and more as long as it subsists. It can never, therefore, make so convenient a transferable stock as a perpetual annuity, of which the real value may be supposed always the same, or very nearly the same.

ANNUL', *v.* Ad; *nullum (ne ullus)*, to nothing. To reduce to nothing, render useless, and of no effect.

Truly the like y^{t} han might to do good, and done it not, ye crown of worship shal be take from hem, with shame shal they be annulled.

Chaucer. Test. of Love, book iii. f. 309, c. 1.

Light, the pure work of God, to me 's extinct,
And all her various objects of delight
Annull'd, which might in part my grief have eased.
Milton.

That which gives force to the law, is the authority that enacts it; and whoever destroys this authority, does in effect *annul* the law. *Rogers.*

AN'NULAR, } *Annulus*, Lat. That which is
AN'NULARY. } in the form of a ring.

That they might not, in bending the arm or leg, rise up, he has tied them to the bones by *annular* ligaments. *Cheyne.*

Because continual respiration is necessary, the windpipe is made with *annulary* cartilages, that the sides of it may not flag and fall together. *Ray.*

ANNULAR CARTILAGE, the second cartilage of the larynx; called also cricoides.

ANNULAR FINGER, the fourth or ring finger.

ANNULAR LIGAMENT, a strong ligament, encompassing the wrist after the manner of a bracelet; also the ligament of the tarsus. The sphincter muscle of the anus is also called annularis from its figure.

ANNULAR PROCESS, a process of the medulla oblongata; so called because it surrounds the same much like a ring.

ANNULARIA, in entomology, a species of phalæna, a native of Germany.

ANNULARIS, a species of cerambyx, in the section callidium, according to Gmelin. Also a species of tenthredo, a native of Austria.

ANNULARIS, in ichthyology, a species of chætodon; the ikan batoe jang aboe, and ikan pampus cambodia of Valent. Ind. &c.

ANNULATA, in entomology, a species of cassida, a native of India. Also 1. A species of chrysomela. 2. A species of nepa. 3. A species of sphinx, according to Linnæus; or zygaena according to Fabricius. 4. A species of phryganea. 5. A species of phalæna. 6. A species of apis. 7. A species of tipula. 8. A species of conops. 9. A species of podwia. 10. Two different species of tenthredo, described by Gmelin; one is the Linnæan species of that name, the other the mantissa of Fabricius.

ANNULATA, in conchology, a species of ostrea, found in the northern seas. Also 1. A species of voluta. 2. A species of helix.

ANNULATORIUS, in entomology, a species of ichneumon, a native of Great Britain.

ANNULATUM, in conchology, a species of dentalium.

ANNULATUS, in conchology, a species of trochus, inhabiting the Indian seas. Also a shell of the turbo genus.

ANNULATUS, in entomology, a species of curculio, a native of America. Also 1. A species of cerambyx, of the family stenocorus. 2. A species of gryllus, of the family locusta, a native of America. 3. A species of cimex, a native of Virginia, belonging to the family of spinosus. 4. Another species of cimex, in the family of reduvius. 5. A species of ichneumon, a native of Europe. 6. A species of asilus, a native of India. 7. A species of culex, a native of Germany and Denmark.

ANNULATUS, in ornithology, a species of oriolus, a native of America.

ANNULATUS, in zoology, a species of coluber. Also a species of anguis.

ANNULET; from annulus, a little ring; in heraldry, a difference or mark of distinction which the fifth brother of any family ought to bear in his coat of arms. Among the Romans it represented liberty and nobility. It also denotes strength and eternity by reason of its circular form. Annulets are also a part of the coat-armour of several families, and were anciently reputed a mark of nobility and jurisdiction, it being the custom of prelates to receive their investiture per baculum et annulum. In architecture, the small square members in the Doric capitals, under the quarter ground, are called annulets. Annulet is also used for a narrow flat moulding, common to other parts of the column; so called because it encompasses the column.

ANNULOSA; from annulus, a ring or segment; a term applied by Cuvier and some other modern writers to animals whose bodies are more or less divided transversely into segments. This type of animals was proposed in one of the last volumes of the Annales de Muséum, by M. G. Cuvier, and comprehends five classes; the leading characters of which are:

Class 1. Crustacea. Branchiæ or gills for respiration. Legs for motion.

Class 2. Myriapoda. Tracheæ or air-tubes for respiration. Legs more than eight. Head distinct from the thorax. Antennæ two.

Class 3. Arachnides. Tracheæ for respiration. Legs eight or six. Head not distinct from the thorax. Antennæ none.

Class 4. Insecta. Tracheæ for respiration. Legs six. Head distinct from the thorax. Antennæ two.

Class 5. Vermes. Tracheæ for respiration. Legs none. Antennæ none. See ZOOLOGY.

ANNULOSUS, in entomology, a species of ichneumon, a native of Europe.

ANNULUS, a ring, in geometry, the area of which is equal to the difference of the areas of the outer and inner circles; or it may be found by multiplying the sum of their diameters by the difference, and the product by 7854.

ANNULUS, in conchology, a species of cypræa. The thoracicum quadratum of Rumphuis; found on the shores of Amboyna and Alexandria.

ANNULUS, in entomology, a species of cassida, a native of Cayenne. Also a species of pis, a native of Europe.

ANNUNCIADA, or ANNUNTIATA, 1. A religious order, instituted in 1232 by seven Florentine merchants called Servites, Servants. 2. A nunnery at Bourges, founded by Joan queen of France after her divorce from Louis XII. 3. A nunnery founded by a Genoese lady in 1600. 4. A friary founded by cardinal Torrecremata at Rome in 1460; the managers of which give fortunes of sixty Roman crowns to above four hundred girls, on the anniversary of the Annunciation. 5. The knights of the annuntiada, a military order, instituted in 1362 by Amadeus VI. duke of Savoy, in memory of Amadeus I. who defended the isle of Rhodes against the Turks. It was at first called the order of the True Lovers Knots, in memory of a bracelet of hair presented to the founder by a lady; but upon the election of Amadeus VIII. to the pontificate, its name was changed for that of the Annunciada in 1435. The great collar of the order which the knights wear on public occasions weighs 250 crowns of gold, and the motto engraved on it is F. E. R. T. The initials were supposed to stand for the words Fortitudo Ejus Rhodum Tenuit, alluding to the defence of Rhodes against the Turks by Amadeus the Grand. This however was long after the house of Savoy took that device, as appears from the coins of Louis de Savoy, baron de Vaud, who died in 1301.

ANNUNCIATION; *ad*, to, and *nuncio*, I declare; the tidings which the angel Gabriel brought to the Virgin Mary of the incarnation of our Saviour. The Greeks call it ευαγγελισμος, good tidings; and χαιριτισμος, salutation.

ANNUNCIATION DAY; the day celebrated by the church in memory of the angel's salutation of the Blessed Virgin, solemnised with us on the 25th of March. This festival appears to be of great antiquity; it is certain that it was observed before the time of the council of Trullo, in which there is a canon forbidding the celebration of all festivals in Lent, excepting the Lord's Day and the Feast of the Annunciation; so that we may date its origin from the seventh century. In the Romish church on this feast the pope performs the ceremony of marrying or cloistering a certain number of maidens, who are presented to him in the church clothed in white serge, and muffled up from head to foot: an officer stands by with purses containing notes of 50 crowns for those who make choice of marriage, and notes of 100 for those who choose the veil. The eastern churches celebrate it at a different season from those of the west. The Syrians call it Bascarah, search, inquiry; and mark it in the calendar for the 1st of December. The Armenians hold it on the 5th of January but the Greeks in Lent. Annunciation is also a title given by the Jews to part of the ceremony of their passover, viz. that wherein they explain the origin and occasion of that solemnity. The explanation they call חגדה, haggada, the annunciation.

ANNUNCIATOR, in the Greek church, an officer whose business is to give notice of the feasts and holydays to be observed.

ANOA, in zoology, bos bubalus anoa, a variety of the buffalo, mentioned by Pennant. It is about the size of a sheep, living in herds and sheltering itself in caverns in the mountains. It is a native of Celebes.

ANOBIUM, in entomology, a genus of coleopterous insects in the Fabrician system, the

ing four clavate feelers; obtuse and dentated jaws; lip entire; and antennæ filiform; with the three extreme joints elongated, and thicker than the others. This genus includes some few insects of the Linnæan ptinus and dermestes genera, and byrrhus of Geoffroy; besides some new species not described by either. The species contained in this genus are tessellatum, striatum, rufipes, castaneum, pertinax, boleti, molle, paniceum, abietis, planum, capense, minutum, micans, and nitidum.

ANOCHEILON, in anatomy, the upper lip.

ANOCHUS, in medicine, a stoppage of the discharge of the bowels.

ANOCTORON, in ecclesiastical history, a name used by some writers for a church. Anoctora properly import Roman halls, many of which were converted into churches.

ANOCYSTI, in natural history, a class of the echina marina, which have an aperture of the anus at the top of the shell. Some of these approach to a hemisphere or spheroidal figure, others flatter, and in shape somewhat resembling a shield.

ANODUS, in chemistry, a nutritious matter separated by the kidneys.

AN'ODYNE, *n.* & *adj.* A privative, and ὀδυνη, pain. That which soothes or mitigates pain.

Yet durst she not too deeply probe the wound,
As hoping still the nobler parts were sound:
But strove with *anodynes* t' assuage the smart,
And mildly thus her med'cine did impart.
Dryden.

Anodynes, or abaters of pain of the alimentary kind, are such things as relax the tension of the affected nervous fibres, as decoctions of emollient substances; those things which destroy the particular acrimony which occasions the pain; or what deadens the sensation of the brain, by procuring sleep.
Arbuthnot.

Or who in sweet vicissitude appears
Of mirth and opium, ratafie and tears,
The daily *anodyne* and nightly draught,
To kill those foes to fair one's time and thought.
Pope's Moral Essays.

ANODYNE; from *a* privative, and ὀδυνη, pain; a term applied to medicines which ease pain and procure sleep. They are divided into three sorts, viz. 1. Paregorics, or such as assuage pain. 2. Hypnotics, or such as relieve by procuring sleep. 3. Narcotics, or such as ease the patient by stupifying him. Opiates and narcotics taken too frequently diminish sensation; in large doses they destroy life. In particular diseases, and in proper doses, they are excellent medicines. Some hypnotics and paregorics, as nitre, camphor, &c. procure ease and sleep by removing the offending cause. Camphor is said to be the best anodyne in nervous cases and at the decline of fevers. But opium, properly administered, is the best of anodynes, excepting in cases where costiveness, a full habit, or the like, prohibit the use of it. The doses of all these medicines are generally regulated by the pulse. Anodynes should be given with great caution, and not on a full stomach, nor in droppes. Hemlock procures ease and sleep, without causing that head-ach next morning, usually complained of after taking opium. Certain compound medicines in the shops are also prepared with this intention. Such is the anodyne balsam. A ready way of preparing a useful, safe, and efficacious anodyne, is as follows: take half an ounce of opium, dissolve it in a gentle heat in three ounces of water, strain the solution and evaporate it to a dry substance. Grind this to powder in a glass mortar, with twice the quantity of loaf-sugar, and of this preparation three or four grains may be given for a dose. By dissolving the opium thus in water, we get rid not only of its gross parts but also of its resinous, which are found more pernicious than the rest; and by dividing it afterwards, and mixing it with sugar, the medicine is rendered more uniform, soluble, and miscible with animal fluids.

ANODYNE BALSAM is made of Castile soap, camphor, saffron, and spirits of wine, digested in a sand heat. It is recommended not only for procuring ease in the most racking extremities of pain, but also for assisting in discharging the peccant matters that occasioned it. This balsam is much the same with the modern opodeldoc.

ANOINT', *v.* ANOINT'ED, ANOINT'ING, ANOINT'MENT. Fr. *oindre*; participle *oint*. To rub with oil, or any fat or greasy substance, and by means of this ceremony to consecrate, set apart, or sanctify.

And the women as soone as it was lawfull to worke, prepared their *annoyntments* with all diligence.
The whole Workes of Tyndall, &c. f. 261. c. i.

For verili eroude and pounce pilat with hethene men and peple of israel, camen togidre in this citee agensthin hooli child ihesu whom thou *anoyntidist* to do the thinges that thin hond and thi conseil demyden to be don.
Wiclif. The Dedis of the Apostlis.

Anointed let me be with deadly venom. *Shaksp.*

Thou shalt have olive trees throughout all thy coasts, but thou shalt not *anoint* thyself with the oil; for thine olive shall cast his fruit.
Deut. xxviii. 40.

Warm waters then in brazen caldrons borne,
Are pour'd to wash his body joint by joint,
And fragrant oils the stiffen'd limbs *anoint*.
Dryden.

I would not see thy sister
In his *anointed* flesh stick boarish fangs.
Shakspeare.

Our blessed Lord himself, who united in his own person the three-fold character of king, priest, and prophet, was distinguished by the name of the Messiah, which, in the Hebrew language, signifies the *anointed*.

ANOINTERS, a religious sect, formerly subsisting in some parts of England, and so called on account of their anointing all persons before they admitted them into the church. They founded this practice upon Jam. v. 14, 15.

ANOINTING is also a term used by painters. It implies their method of restoring the effect of colours, after the oil has been drained out of them, by the absorption of the ground of the picture, or the former coat or layer of colours, whilst they were drying; termed improperly the sinking of the colours. The anointing is performed by means of varnish, oil, or both together, rubbed in with a hard hog's-hair tool. When newly laid on, it promotes softness and

union; and when almost, but not perfectly dry, it disposes the picture to receive smart or crank touches. Without an application of this nature it would be impossible for the painter of delicate works to proceed with any degree of certainty; and the best mixture is an equal quantity of strong drying oil and mastich varnish united. This will retain its clammy nature long enough for the purpose of the artist, while he covers with paint the anointed portion. Such artists as proceed more slowly with the pencil than is usual, will do well to use a small quantity of fat linseed oil with the mixture we have mentioned.

ANOLE, in zoology, a species of lizard common in the West Indies about houses and plantations. It is of the size of the common European lizard, but its head is longer, its skin of a yellowish colour, and its back variegated with green, blue, and gray lines running from the neck to the tail. They creep into holes at night, and make a continual and very disagreeable noise: in the day they are always in motion.

ANOLYMPIADES, in antiquity, a name given by the Elians to those Olympic games which had been celebrated under the direction of the Pisæans and Arcadians. The Elians claimed the sole right of managing the Olympic games, in which they sometimes met with competitors. The 104th Olympiad was celebrated by order of the Arcadians, by whom the Elians were at that time reduced very low; this as well as those managed by the inhabitants of Pisa, they called *ανολυμπιαδας*, that is, unlawful Olympiads; and left them out of their annals, wherein the names of their victors and other occurrences were registered.

ANOMALISTICAL Year, in astronomy, is also called the periodical year. The space of time belonging to this year is greater than the tropical year on account of the precession of the equinoxes. See Astronomy.

Anomalous Nouns. In those languages wherein the nouns are declined by genders, numbers, and cases, such as the Greek and Latin, there are a vast number of anomalous nouns, which are either defective, redundant, or variable, in one or other of these particulars. Thus liberi and arma want the singular; aer and ævum the plural; chaos wants the genitive; suppetiæ wants four cases, and dicis five; cætera wants the masculine, quisquis the feminine, and plus both; and cœlum, plural cœli; and locus, loci or loca are variable; and materia, materies, æther, æthra, &c. are redundant. But it is not in inflexion or declension alone that nouns are anomalous. Adjectives are also frequently so in comparison: thus bonus, by the regular rule of comparison, should have bonior, bonissimus, in the comparative and superlative degrees: instead of which it has melior and optimus. The same adjective is equally anomalous in the Greek, as well as extremely redundant; *αγαθος*, having no fewer than seven comparatives, *αμεινων*, *αρειων*, *βελτιων*, *καρρων*, *κρειτων*, *λωιων*, and *χερειων*; and four superlatives, *αριστος*, *βελτιστος*, *κρατιστος*, and *λφτος*: all of which are completely anomalous in their formation. In the English language, which has neither genders nor cases, the few anomalous nouns it has are only so in number and comparison. Thus the substantive annals wants the singular, and sir wants the plural. The adjectives good and evil instead of forming their comparatives and superlatives according to the usual rule, by adding er and est (which would make gooder, goodest, eviler, evilest), have the very irregular degrees of better, best, and worse, worst. The adjective little affords an instance of a double anomaly in its comparison, being both irregular in the formation of its degrees, less and least, and redundant, by having another comparative, lesser.

Anomalous Verbs, in grammar, such as are not conjugated conformably to the paradigm of their conjugation. They are found in all languages. In Latin the verb lego is the paradigm of the third conjugation; and runs thus, lego, legis, legit: by the same rule fero should be feris, ferit; fero is therefore an anomalous verb. In English the irregularity relates often to the preterite tense and passive participle: for example, give, were it formed according to rule, would make gived in the preterite tense and passive participle; whereas in the former it makes gave, and in the latter given.

ANOM'ALY, *n.* } Gr. *Ανωμαλης*, not plain,
Anom'alous, } *α* & *ομαλος*, plain. Deviation from the general rule,
Anom'alously. } irregularity.

Eve was not solemnly begotten, but suddenly framed, and *anomalously* proceeded from Adam.
Brown's Vulgar Errours.

There will arise *anomalous* disturbances, not only in civil and artificial, but also in military officers.
Id.

He being acquainted with some characters of every speech, you may at pleasure make him understand *anomalous* pronunciation. *Holder.*

Metals are gold, silver, copper, tin, lead, and iron; to which we may join that *anomalous* body, quicksilver or mercury. *Locke.*

If we should chance to find a mother debauching her daughter, as such monsters have been seen, we must charge this upon a peculiar *anomaly* and baseness of nature. *South.*

I do not pursue the many pseudographies in use; but intend to show, how most of these *anomalies* in writing might be avoided, and better supplied.
Holder.

Every language has its *anomalies*, which, though inconvenient and in themselves unnecessary, must be tolerated among the imperfections of human things. *Dr. Johnson's Preface to his Dictionary.*

The poetical dialect, consisting chiefly in certain *anomalies*, peculiar to poetry; in letters and syllables added to the ends of words; a kind of licence commonly permitted to poetry in every language.
Lowth's Isaiah. Preliminary Disc.

Anomaly, in astronomy; from *ανωμαλης*, unequal, Gr. *anomalia*, Lat. is an irregularity in the mean motion of the planets, whereby they deviate from the aphelion, or apogee; or it is the angular distance of the primary planets from their aphelion, or of the sun and moon from their apogee; which inequality is either mean, eccentric, or true.

Mean or simple anomaly is where a planet describes an ellipsis about the sun, placed in one of the foci, and is the time it takes up in moving from its aphelion to the mean place or point of its orbit, and is equal to the angle contained

between the line of the apsides, or transverse diameter, and a line drawn from the sun to the centre of the planet.

Eccentric anomaly, or of the centre, is an arch of the eccentric circle cut off by a right line drawn perpendicular to the transverse diameter of the orbit.

True or equated anomaly is the distance of the sun from his apogee, or a planet from its aphelion, seen from the sun; that is, the distance of a planet in signs, degrees, minutes, &c. from that point of its orbit which is farthest from the sun. It is a very difficult, and, at the same time, a very useful problem, to find directly the true anomaly from the mean one given; the motion of the earth being in an elliptical orbit, its true anomaly will differ from the mean; this difference is called the equation of the centre, and is the correction to be applied to reduce the mean motions to the true ones. See *Hutton's Mat. and Phil. Dict.* vol. i. p. 120.

ANOMATHECA, in botany; from *ανομος*, out of rule, and *θηκη*, a case; so called because the capsule is distinguished by its papillary roughness: class, triandria; order, monogynia: nat. ord. ensatæ. Its generic characters are, CAL. sheath inferior, bivalved; valves concave, leafy: COR. one petal, superior, salver-shaped; tube longer than the sheath, nearly cylindrical, a little dilated at the mouth; limb not quite regular, six segments: STAM. three filaments, inserted into the tube, thread-shaped, erect, short; anthers vertical, converging: PIST. germ roundish: STYL. thread-shaped, the length of the stamens: STIG. three: PERIC. roundish-ovate capsule, three cells, trivalved; its surface covered with small papillary tubercles: SEEDS numerous and round. Its essential characters are, sheath bivalved: COR. salver-shaped: STIG. three, divided; capsule tuberculated. There is but one species: A. juncea, cut-leaved anomatheca; found by Thunberg at the Cape of Good Hope.

ANOMIA, or bowl-shell, in zoology, a genus of insects belonging to the order of vermes testacea. The shell is bivalve, and the shells are unequal. One valve is perforated near the hinge, and affixed by that perforation to some other body. Twenty-five species of the anomia have been enumerated; the following are the most remarkable: 1. A. ephippium, of the habits of an oyster; the one side convex, the other flat; perforated; adherent to other bodies, often to oyster-shells, by a strong tendinous ligature. The colour of the inside is perlaceous; the size near two inches in diameter. 2. A. squamula, with shells resembling the scales of fish; very delicate and silvery; much flatted; perforated, and very small. It adheres to oysters, crabs, lobsters, and shells. The species of this genus are commonly called beaked cockles. 3. A. electra, amber bowl-shell, differing from the ephippium principally in its colour. 4. A. cepa, onion-peeled bowl-shell. 5. A. aculeata, prickly bowl-shell. 6. A. undulata, striated bowl-shell. 7. A. psittaca, parrot-beak bowl-shell. This shell, which is very rare, is of a blackish horn colour, semitransparent, oval, rather convex, with numerous very fine regular longitudinal ribs; the sides abruptly turned in and flattened, without the ribs, but marked with a few irregular striæ; the front margin a little indented on each side and projecting in the middle; one valve produced into an elongated incurved and pointed beak, like a parrot's bill; the other oval and rather flat; the perforation somewhat triangular: inside dull grayish-white, with a strong tooth-like projection each side a little below the beak, and reaching down the incurvature of the sides in a strong rib-like form: length nearly an inch and a quarter; breadth an inch; specimens have been found on the shore near Teignmouth after a severe gale: and it is supposed to come from very great depths.

ANOMIA, the fossile. These are uncommonly numerous in this island, in chalk-pits and limestone quarries; in Gloucestershire they are as common on the ploughed lands as pebbles.

ANOMŒANS, in ecclesiastical history, the name by which the stricter Arians were called in the fourth century, in contradistinction to the Semi-Arians. The word is formed from the Greek *ανομοιος*, dissimilar: for the strict Arians asserted that the Son was of a nature different from, and in nothing like that of the Father: whereas the Semi-Arians acknowledged a likeness of nature in the Son; at the same time that they denied the consubstantiality of the Word.

ANOMORRHOMBOIDIA; from *ανωμαλος*, irregular, and *ρομβοιδης*, a rhomboidal figure; in natural history a genus of spars. The bodies of this genus are pellucid crystalline spars of no determination or regular external form; but always breaking into regularly rhomboidal masses; easily fissile, and composed of plates running both horizontally and perpendicularly through the masses, but cleaving more readily and evenly in an horizontal than in a perpendicular direction; the plates being ever composed of irregular arrangements of rhomboidal concretions. Of this genus there are five known species; viz. 1. A white, bright, and shattery one, found in great quantities in the lead mines of Derbyshire, Yorkshire, and Wales; 2. A milk-white opaque and shattery one, found in some parts of France, and very plentifully in Germany, and sometimes in Wales and Scotland, and in the hills of Yorkshire; 3. A hard, dull, and snow white one, found in some of the mines in Derbyshire, and in many of our northern countries; 4. A hard, gray and pellucid one, found in the lead mines of Yorkshire, and very common in Germany; and 5. A pellucid and colourless one, this is found in the lead mines of Derbyshire and Yorkshire. All these in some degree have their double refraction of the ICELANDIC CRYSTAL, which see.

AN'OMY. *ανομια* Hellenistic Greek; A, privative, and *νομος*, a law; Fr. *anomie*, without law. Obsolete.

If we have respect unto the infinite mercy of God; and to the object of this mercy, the penitent and faithful heart, there is no sin, which to borrow the word of Prudentius, is not venial; but in respect of the *anomy* or disorder, there is no sin which is not worthy of eternal death.

Bp. Hall's Polemical Works.

If sin be good, and just, and lawful, it is no more evil, it is no sin, no *anomy*. *Bramhall against Hobbes.*

ANON', *ad.* On An, on or in one: in one, [minute] immediately, in an instant: the reply of waiters at an inn was formerly, 'Anon, Sir;' equivalent to, 'Coming, Sir.'

Right now the highe windes blowe,
And *anon* after thei ben lowe.
Gower. Con. A. the Prologue.

And Arcite *anon* his honde up hafe.
Chaucer. Knyghtes Tale, f. 8. c. i.

But this that is sowen on the stoney lond: this it is that hereith the word of God, and *anon* with joie takith it. *Wiclif. Matt.* c. xiii.

He was not without design at that present, as shall be made out *anon*; meaning, by that device to withdraw himself. *Clarendon.*

Still as I did the leaves inspire,
With such a purple light they shone,
As if they had been made of fire,
And spreading so would flame *anon*. *Waller.*

A little snow tumbled about.
Anon becomes a mountain. *Shaksp.*

Will they come abroad *anon?*
Shall we see young Oberon? *Ben. Jonson.*

However, witness heav'n!
Heav'n witness thou *anon!* while we discharge
Freely our part. *Milton.*

Full forty days he pass'd, whether on hill
Sometimes, *anon* in shady vale, each night,
Or harbour'd in one cave, is not reveal'd. *Id.*

Box'd in a chair the beau impatient sits,
While spouts run clattering o'er the roof by fits;
And ever and *anon*, with frightful din
The leather sounds, he trembles from within.
Swift's Description of a City Shower.

ANON'YMOUS, ANON'YMOUSLY, ANON'YMAL. A, not, and *ονομα*, a name; without a name: particularly applied to writings from which the names of the authors are withheld.

I would know whether the edition is to come out *anonymously*, among complaints of spurious editions. *Swift.*

These animalcules serve also for food to another *anonymous* insect of the waters. *Ray.*

They would forthwith publish slanders unpublished, the authors being *anonymous*, the immediate publishers thereof sculking. *Notes on the Dunciad.*

ANONYMOUS, in commerce. Before the late revolution, partnerships in trade in France were styled anonymous, when they were not carried on under any particular name, but wherein each of the partners traded visibly on his own account, and in his own name; after which all the partners gave one another an account of their profit or loss. These sorts of partnerships were known only to the parties themselves. There was also another species of anonymous partnerships in France, wherein persons of fortune and quality deposited sums of money, in order to share the profit and loss. Those who furnished the capital had no trouble in carrying on the trade, nor did their names appear to be any way interested therein.

ANONYMOUS, in law. The sending anonymous letters demanding money, &c. is felony by the Black Act, 9 Geo. I. cap. 22.

ANONYMOUS SPIRIT, in chemistry, a spirit extracted from tar and wood.

ANOPSHEHER, an ancient town of Hindostan, on the Ganges, in the district of Bareily (finally ceded to the British in 1802), and province of Delhi. Its name signifies the 'incomparable city.' A strong mud wall, which has formerly been its principal defence, nearly surrounds the town. In some places it is between thirty and forty feet thick. On the south is a brick fort, of considerable size, containing loopholes for the use of bows and arrows, but incapable of defence by cannon. This place commands a fine view of the Ganges, and of the Cummoes, or Snowy Mountains (distant 200 miles) to the north-east, from which the bleak winds frequently bring agues. Eastward the lands are annually overflowed by the river, and are productive of grain, cattle, and game. Anopsheher has a good cotton and indigo trade, and receives from the Sambler lake considerable supplies of salt. It stands in lat. 28° 21′ N. long. 78° 13′ E. The Ganges is fordable here in December.

ANOREXY; from *α* neg. and *ορεξης*, appetite; in medicine, is either original or symptomatic. When it is original, its causes are bad diet, too free drinking, voraciousness, &c.: in which cases, a vomit of ipecacuanha may be taken; after which temperance, a light but cordial nourishing diet, and daily exercise, persisted in, will generally effect a recovery. But it is more frequently a symptom of some other disorder; and then the cure depends on the removal of the original one.

ANOSMIA, in medicine; from *α* privative, and *οσμη*, smell, i. e. without smell; a disease attended with a diminution or loss of smell.

ANOSSI, a province of the island of Madagascar, lying between lat. 23° 18′, and 26° S. It is watered by many rivers. In 1642 Captain Rivault obtained a permission to establish a colony in this part of the island, and accordingly he took possession of it in the name of the king of France, in September. The French landed 200 men, well armed, and provided with stores of ammunition and other necessaries for building a fort, which they immediately set about; but no sooner did the natives observe their intention, than they used their utmost art to prevent their design from taking effect. This created a war, in which the French were victors; and, the natives becoming in time much better reconciled to them, they intermarried, and lived in several towns at some distance from one another, not above five or six in a place. This tranquillity lasted for some years; but at last the natives growing jealous, resolved to free themselves from a foreign yoke, and accordingly formed a conspiracy to cut off all the French in one day; which they soon after effected, not leaving a single person alive. In 1664, Fort Dauphin was erected, in lat. 25° 6′ S. Many buildings were erected behind the fort, adjoining to the governor's house, with great enclosures that produced every sort of fruit and kitchen herb. In 1656 this fort was accidentally destroyed by fire, but was soon after repaired; and notwithstanding the above catastrophe the French maintained a garrison here until the neighbouring settlements of Bourbon and Mauritius fell in the late war into the hands of the English.

ANOTH'ER, *a.* ANOTH'ER-GAINS, ANOTH'ER-GUESS, ANOTH'ER-GATES. On other: the words compounded are obsolete usages.

For if he that cometh prechith *anothir* Crist whom we prechhidden not, or if ghe faken *a nothir* spyryt whom ghe tooken not, or *a nothir* gospel which she resseyuyden not rightli she suldem suffre.

Wiclif. 2 *Corynth.* ch. xi.

For stature one doth seem the best way to hear;
Another for her shape, and to stand beyond compare;
Another for the fine composure of a face;
Another short of these, yet, for a modest grace,
Before them all prefer'd.

Drayton's Polyolbion, song xxvi.

——————A fourth?——————
What! will the line stretch out to th' crack o' doom?
Another yet?—a seventh? I'll see no more.

Shakspeare.

If one man sin against *another*, the judge shall judge him. 1 *Samuel* ii. 25.

Why not of her? prefer'd above the rest
By him with knightly deeds, and open love profess'd,
So had *another* been, where he his vows address'd.

Dryden.

Oh Hocus! where art thou? it used to go in *anotherguess* manner in thy time. *Arbuthnot.*

He that will not lay a foundation for perpetual disorder, must of necessity find *another* rise of government than that. *Locke.*

When the soul is beaten from its station, and the mounds of virtue are broken down, it becomes quite *another* thing from what it was before. *South.*

The sphere in which we move, and act, and understand, is of a wider circumference to one creature than to *another*, according as we rise one above *another* in the scale of existence. *Spectator.*

ANOTTA, Anotto, or Arnotta. See Annotto.

ANOURAMA, a river of Brasil, in the province of Para, which, running east, joins the Amazons between the Urupi and Maracupuca.

ANOUT, a small island in the Scaggerrac, or that part of the sea of Denmark, which has Norway on the north, Jutland on the west, and the isle of Zealand on the south. Long. 13° 0′ E., lat. 56° 36′ N.

ANPITS, in the military art, in writers of the middle age, a breast-work, or barbacan.

ANQUETIL (Louis Peter), a French historian, and political writer, was born in 1723, and died in 1808. His principal writings are, 1. Histoire Civile et Politique de la Ville de Rheims, 3 vols. 12mo. 1756, 1757. 2. Almanach de Rheims, 24mo. 1754. 3. L'Esprit de la Ligue, &c. 3 vols. 12mo. 1767. 4. Intrigue du Cabinet sous Henri IV. et sous Louis XIII. &c. 4 vols. 12mo. 1780. 5. Louis XIV. sa Cour et le Regent, 4 vols. 12mo. 1789. 6. Vie du Mareschal Villars, écrite par Lui-même, suivie du Journal de la Cour de 1724 à 1734, 4 vols. 12mo. 1787—1792. 7. Précis de l'Histoire Universelle 9 vols. 12mo. &c.

Anquetil de Perron (Abraham Hyacinth), brother of the subject of the last article, was born in 1731. In order to gratify his thirst after Oriental literature, he quitted all thoughts of the ecclesiastical profession, in which he had very excellent prospects, and actually joined the expedition fitting out for India in 1754, as a private soldier. At Chandernagore, Pondicherry, and Surat, though interrupted by illness, he employed every moment of his leisure in the study of the Sanscrit, and made sufficient progress in that tongue to translate the Vendidad Sade. On the taking of Pondicherry by the English, he returned to Europe, visited London and Oxford, and succeeded in 1762 in conveying the various manuscripts he had obtained to Paris. He was then appointed Oriental interpreter in the king's library, with a pension, and devoted himself to the publication of his works, which are, A Life of Zoroaster, prefixed to a translation of the celebrated Zend Avesta, attributed to that sage, in 3 vols. 4to. 1771; Législation Orientale, 4to. 1778; Recherches Historiques et Geographiques sur l'Inde, 1786; A Treatise on Commerce, 1789; L'Inde au rapport avec l'Europe, 1798, 2 vols. 8vo; and Secrets not to be Revealed, a Latin translation, in two 4to. volumes, from the Persian. He died, 1805, three years before his brother.

ANSÆ, or Anses, in astronomy, the parts of Saturn's ring, projecting beyond the disc of the planet. The word is Latin, and properly signifies handles; these parts of the ring appearing like handles to the body of the planet: also in music the finger-boards of organs.

ANSARIANS, a people of Syria, so called in that country, but styled in Delisle's maps Ensarians; and in those of Danville Nassaris. The territory said to be occupied by the Ansarians is that chain of mountains which extends from Antakia to the rivulet called Nahr-el-Kahi, or the Great River. The history of their origin is little known. The following account, taken from the Bibliotheque Orientale of Assemani, is drawn from the best authorities: 'In the year of the Greeks 1202 (A.D. 891), there lived at the village of Nasar, in the environs of Kousa, an old man, who, from his fastings, his continual prayers, and his poverty, passed for a saint; several of the common people declaring themselves his partisans, he selected from among them twelve disciples to propagate his doctrine. But the commandant of the place, alarmed at his proceedings, seized the old man, and confined him in prison. In this situation he excited the pity of a girl who was a slave to the gaoler, and she determined to give him his liberty: an opportunity soon offered to effect her design. One day when the gaoler was gone to bed intoxicated, and in a profound sleep, she gently took the keys from under his pillow, and, after opening the door to the old man, returned them to their place unperceived by her master: the next day when the gaoler went to visit his prisoner, he was extremely astonished at finding he had made his escape, as he could perceive no marks of violence. He therefore concluded he had been delivered by an angel, and spread the report, to avoid the reprehension he merited; the old man, on the other hand, asserted the same thing to his disciples, and preached his doctrines with more earnestness than ever. He even wrote a book in which, among other things, he says, 'I, such a one, of the village of Nasar, have seen Christ, who is the word of God, who is Ahmad, son of Mohammed, son of Hanasa, of the race of Ali; who also is Gabriel: and he said to me, Thou art he who readeth (with understanding); thou art the man who speaketh truth; thou art the camel which preserveth the faithful from wrath; thou art the beast which carrieth their burden; thou

art the (Holy) Spirit, and John, the son of Zachary! Go, and preach to men that they make four genuflections in praying; two before the rising of the sun, and two before his setting, turning their faces towards Jerusalem: and let them say, three times, God Almighty! God Most High! God Most Great! Let them observe only the second and third festival; let them fast but two days annually; let them not wash the prepuce: nor drink beer, but as much wine as they think proper; and, lastly, let them abstain from the flesh of carnivorous animals.'

The Ansarians, according to Volney, are divided into several tribes or sects; among which are distinguished the Shamsia, or adorers of the sun; the Kelbia, or worshippers of the dog; and the Kadmousia. Many of them believe in the metempsychosis; others reject the immortality of the soul. Their country is divided into three principal districts farmed by the chiefs called Makaddamim. Their tribute is paid to the Pacha of Tripoli, from whom they annually receive their title. Their mountains are in general not so steep as those of Lebanon, and consequently are better adapted to cultivation; but they are also more exposed to the Turks, and hence, doubtless, it happens that with greater plenty of corn, tobacco, wines, and olives, they are more thinly inhabited than those of their neighbours the Maronites and the Druses; which see.

ANSARIUM, or Ansurium, in civil law, a duty on all provisions carried in vessels with ansæ, or handles

ANSART (Andrew Joseph), a French ecclesiastical writer and historian, born in 1723. He first became a Benedictine monk; but having been appointed procurator of one of the houses of that order, disappeared with the funds. He afterwards attached himself to the order of Malta, and became an advocate and doctor of laws of the faculty of Paris, and finally prior of Villanova. His principal works are: Dialogues sur l'Utilite des Moines Rentés, 1763, 12mo.; Exposition sur les Cantiques des Cantiques de Soloman, 1770, 12mo.; The Histoires of St. Maur, St. Reine, d'Alise, St. Fiacre, &c.; and the Bibliotheque Litteraire du Maine, 1784, 8vo. He died in 1790.

ANSATUM Telum, in ancient warfare, a dart or javelin, with an amentum fastened to it. Ansæ of a javelin are those two eminences about the middle of the cuspis, or point, which hinder the weapon from piercing through the whole body.

ANSATUS, in conchology, a species of murex. It is brown, transversely striated; spire sharp-pointed; whorls convex, distant, and knotty at the base; beak long.—*Gmelin.* The length of this shell is about five inches and a half, and the striæ are large and small alternately.

ANSE, an ancient town of France, in the department of the Rhone and Loire, ten miles north of Lyons, and twenty-five south by west of Macon.

ANSELM, Hanszhelm, Teut. i. e. a defender of his companions, archbishop of Canterbury in the reigns of William I. and Henry I., born in 1033 at Aost, in Savoy. He became a monk in the abbey of Bec, in Normandy, of which he was afterwards chosen prior and then abbot. In 1092 he was invited over to England by Hugh earl of Chester; and in 1093 was made archbishop of Canterbury. He enjoined celibacy on the clergy, for which he was banished by William, but recalled by Henry at his coming to the crown. He refused to consecrate bishops invested by the king, flatly denying it to be the king's prerogative; for this he was again banished, till the pope and king agreeing, he was recalled in 1107. This prelate, from the day of his consecration to his death, was continually contending for the prerogative of the church against that of the crown, and for that purpose spent much of his time in travelling backwards and forwards between England and Rome for the advice and direction of the pope. At the council of Bari in Naples, the holy father being perplexed by the arguments of the Greeks against the Holy Ghost's proceeding from the Father, he called upon Anselm, who was present, and he discussed their objections with great applause. The pope afterwards deserted Anselm, who went to Lyons, where he resided till the death of William, when he returned to England and was received with great respect; but a new rupture arose, by the archbishop refusing to be re-invested by the king; on which a reference was made to the pope, who decided in favour of Anselm. This induced the nobility to advise the king to break absolutely with the pope, in consequence of which some of them were excommunicated. At length the pope made a concession, by allowing the English bishops and abbots to do homage to the king for their temporalities, which restored Anselm to favour. The priests call him a resolute saint; to other people he appears to have been an obstinate and insolent priest. He wrought many miracles, if we believe the author of his life, both before and after his death, which happened at Canterbury in the seventy-sixth year of his age, anno 1109. He was canonised in the reign of Henry VII. Anselm, though we may disregard him as a saint, deserves to be remembered as one of the principal revivers of literature after three centuries of profound ignorance. His works have been printed in different years, and at different places; but the best edition is that of father Gerberon, Paris, 1675.

Anselm of Parma, a celebrated magician, or rather juggling impostor, said by Derio, in his Disquisitiones Magicæ, to have performed miraculous cures by what is called St. Anselm's art, or by merely touching the linen that covered them.

ANSER Americanus, the toucan.

Anser, in astronomy, a small star of the fifth or sixth magnitude, in the milky way, between the swan and eagle, first brought into order by Hevelius.

Anser, Lat. the goose, in ornithology, a species of Anas. See Anas.

Anseres, in zoology, the name which Linnæus gives to his third order of birds, having the bill somewhat obtuse, and covered with a skin; gibbous at the base; the mouth toothed; the tongue fleshy; feet palmate, formed for swimming. It includes the following genera: nares)

1. Those having a bill with teeth, as — Anas, goose, swan, duck. &c.; bill convex, obtuse; three fore toes connected—Mergus, merganser; bill hooked at the point; feet four-toed; the outer toe longest — Phæton, tropic-bird; bill sharp-edged; hind toe turned forwards—Plotus, darter; bill pointed; feet, all the toes connected. 2. Those having a bill without teeth, as—Rynchops; the bill upper mandible much shorter, lower truncate—Diomedea, albatross; bill, upper mandible hooked, lower truncate; feet four-toed, all placed forward—Aptenodyta, penguin; bill sharp-edged; feet fettered, four-toed—Alca, auk; bill short, compressed; feet, mostly three-toed—Procellaria, petrel; bill hooked at the point, mandibles equal; feet, the back toe pointing downwards—Pelicanus, pelican; bill furnished with a nail; feet, all the fore toes palmate—Larus, gull; bill sharp-edged; feet, back toe small—Sterna, tern; bill pointed; feet, back toe small—Colymbus; bill subulate; feet fettered.

ANSERMA, Santa Ana De, a city of South America, in the province of Popayan, fifty leagues N.E. of the city of that name.

ANSIBARII, or Ansivarii, an ancient people of Germany, situated in the neighbourhood of the Chauci. All we know of their history is, that, in the reign of Nero, they were driven from their own possessions by the Chauci. They then took possession of some uninhabited lands, which had been used as pasture for the horses of the Roman soldiers, and they were led by one Boiocalus, a man of great valour, and of known fidelity to the Romans. He remonstrated to the Romans, who objected to their taking possession of these lands, that the territory in dispute was large, and requested that it might be allowed to an unhappy people driven from their own habitations; that at the same time wide tracts might be retained for the horses and cattle of the soldiers to graze in; that it was inconsistent with humanity to famish men in order to feed beasts, &c.; and at last, lifting up his eyes to heaven, he asked the celestial luminaries how they could behold a desolate soil, and if they would not more justly let loose the sea to swallow up usurpers, who had engrossed the whole earth. To this the Roman commander, Avitus, replied, that the weakest must submit to the strongest; and that since the gods, to whom they had appealed, had left the sovereign judgment to Rome, they were resolved to suffer no other judges than themselves. To Boiccalus himself, however, he privately offered lands as a reward for his long attachment to the Romans: but this offer the brave German rejected, as a price for betraying his people; adding, 'A place to live in we may want, but a place to die in we cannot.' The Ansibarii now invited the neighbouring nations to join them against the Romans; but they, dreading the power of that nation, refused to give them any assistance; and being everywhere driven out as enemies and intruders, these unhappy people were reduced to wander up and down till every one of them perished.

ANSLAIGHT', or Onslaught'. } Ang. Sax. On-slagan, past tense of on-slagan, to dash or beat against, dashed or beaten against.

That done, awhile they made a halt
To view the ground, and where the assault
Then call'd a council which was best,
By siege or *onslaught*, to invest
The enemy; and 'twas agreed
By storm and *onslaught* to proceed.
Butler's Hudibras.

ANSON (George), the son of William Anson, Esq. was born in 1697, at his father's seat in Staffordshire. Showing an early inclination to the sea, he received a suitable education. The first command he enjoyed was that of the Weasle sloop in 1722; but the most memorable action of his life, and the foundation of his future good fortune, took place on his receiving the command of five ships, a sloop, and two victuallers, equipped to annoy the Spaniards in the South Seas, and to co-operate with admiral Vernon across the isthmus of Darien: an expedition the principal object of which failed, by the unaccountable delay in fitting out the squadron. He sailed however in September, 1740; doubled Cape Horn in a dangerous season; lost most of his men by the scurvy; and with only one remaining ship, the Centurion, crossed the great Pacific Ocean. If no considerable national advantage resulted from this voyage, Commodore Anson made his own fortune, and enriched his surviving companions, by the capture of a rich galleon on her passage from Acapulco to Manilla, with which he returned home round the Cape of Good Hope. He was no less fortunate in escaping a French fleet then cruising in the channel, by sailing through it during a fog. He arrived at Spithead in June, 1744. He was soon after appointed rear-admiral of the blue, and a lord of the admiralty. In April, 1745, he was made rear-admiral of the white, and the following year vice-admiral of the blue; when he was also chosen M. P. for Heydon. In 1747, being on board the Prince George of ninety guns, in company with admiral Warren, and twelve other ships, he intercepted, off Cape Finisterre, a powerful fleet, bound from France to the East and West Indies; when he again enriched himself and his officers, and at the same time strengthened the British navy, by taking six men of war and four East-Indiamen. The French admiral, M. Jonquiere, on presenting his sword to the conqueror, said, 'Monsieur, vous avez vaincu l'Invincible, et la Gloire vous suit:' 'Sir, you have conquered the Invincible, and Glory follows you;' pointing to the ships, named the Invincible and the Glory, he had taken. For his signal services George II. created him Baron Soberton, appointed him vice-admiral of the red, and, on the death of Sir John Norris, made him vice-admiral of England. In 1748 he was made admiral of the blue; afterwards first lord of the admiralty; and at length admiral and commander-in-chief of his majesty's fleet; in which rank he continued, with a very short interval, until his death. The last service he performed was to convey queen Charlotte to England. He died in June, 1762. No performance ever met with a more favourable reception, than the account of Anson's voyage round the world. Though printed in the name of his chaplain, it was composed under his lordship's inspection, and from the

materials he himself furnished, by Mr. Benjamin Robins. Lord Anson was a cool and steady man, but too fond of gaming, of which knowing little, he was the constant dupe of sharpers; which made the wits observe 'though he had been round the world, he never was in it.'

Anson, an interior county of North Carolina, in Fayette district, having Mecklenburgh county, north; and Bladen and Cumberland counties, west.

Anson's Bay, a small bay, with a sandy beach, on the west coast of Norfolk island.

ANSPACH, Ansbach, or Onobzbach, a district in Franconia, formerly bounded on the north by Wurtzburg, Bamberg, Bayreuth, and Schwartzenberg; on the west by Hohenlohe and Suabia; on the south by Pappenheim, Oettingen and Eichstadt, and on the east by the Upper Palatinate and territory of Nuremberg. It was governed by a margrave, and was divided into fifteen upper bailiwicks; but this distribution was altered in 1797, when it was formed into five districts or circles, each of which had its own exchequer-chamber and courts of justice. The surface contained about 1800 square miles, on which were built one fortified place, sixteen towns, twenty-eight boroughs, 324 villages, 879 hamlets, and 536 farm houses and mills. The population of the whole was reported in 1774 to be 124,445, whereof 4500 were Jews; but in 1803 this number was found, partly by a more exact survey, partly by an increase in the interval, to be augmented to 252,295, including 8534 Jews. The public revenue used formerly to be computed at 380,000 florins, but from the new accessions, and the better policy of the Prussian government, to whom this principality for some time belonged, it was raised to 1,000,000 florins, or £100,000 sterling. Here are cultivated corn, fruit, wine, and hops; the first in considerable quantities. The breed of horses has been greatly improved by intermixture with those of England; and that of oxen and cows with those of Switzerland. Numbers of fattened oxen are yearly sent to Alsace. Manufactures flourish in the towns of Furth, Schwabach and Roth; the established religion is the Lutheran. The military contingent of this principality and Bayreuth, when in the possession of Prussia, was two regiments of infantry, one of hussars, and one battalion of light infantry. In 1791 the last margrave of Anspach retired to England, and the principality became an integral part of the Prussian monarchy. It was given to Bavaria by Bonaparte in 1806, and has been confirmed to that power by recent treaties, an indemnity having been given elsewhere to Prussia. Part of it was formed in 1808 into the circle of Rezat, containing, with the additions made to it from an adjacent territory, 219,854 inhabitants. The other part of the margravate, containing about 100,000 inhabitants, went to the circles of the Altmuhl and Pegnitz, both also in the kingdom of Bavaria. By a more recent distribution made in 1810, Anspach is mostly included in the circles of the Rezat and the Upper Danube.

Anspach, or Ansbach, once the capital of the preceding margravate, lies on the Lower Rezat. It may be said to owe its origin to Gumbredt, son of duke Gosbert I. who founded here a monastery of Benedictines. This establishment was secularised in 1563, previous to which the town, which had been gradually formed around it, was purchased by the burgrave of Nuremberg. It has four suburbs and about 100 houses. The prince's castle and gardens, the church of St. John with the tombs of the princes, a well endowed orphan house for sixty children, and a hospital, are worthy the traveller's notice. The prince's library and cabinet of medals were begun to be collected by the margrave William Frederic in 1720; the former contains 15,000 volumes, but the latter has been transported to Berlin. The academy, which received considerable additions after the dissolution of that of Heilbronn, consists of six classes, and has an inspector, three professors, and five other teachers. The articles principally manufactured are woollen and cotton cloths, earthenware, white-lead and playing cards. This town contained, in 1807, including the neighbouring communes, 11,924 inhabitants. It was created, the following year, the capital of the circle of Rezat in Bavaria, and at the same time the head of a district, which contains 126 square miles, and 14,000 inhabitants. What was called the circle of Anspach does not now therefore exist. The town stands about thirty miles south-west of Nuremberg. Long. 10° 33′ E., lat. 48° 12′ N.

ANSPESSADES, or Lanspessades, in the French army, before the revolution, a kind of inferior officers in the foot, below the corporals, but above the common centinels. The word is formed of the Italian, lancia spezzata, i. e. broken lance; as they were originally disbanded gendarmes, who, for want of other subsistence, sued for a place of some distinction in the infantry. There were usually four or five in each company.

ANSTEY (Christopher), an ingenious poet of the eighteenth century, was the son of the Rev. Christopher Anstey, D. D. and born in 1724. He was educated at Bury St. Edmunds, whence he removed to Eton, and succeeded in 1742 to a scholarship in King's college, Cambridge, and in due time to a fellowship. In 1754 he succeeded to his patrimonial property, when he resigned his fellowship, and married Ann, daughter of Felix Calvert, esq. of Albury Hall, Herts, by whom he had thirteen children, eight of whom survived him. He then devoted himself to literary pursuits, but after a while resided for the most part at Bath. He had long cultivated poetry, but most of his early productions were Latin translations of English popular poems, one of which was Gray's elegy. It was not until 1766 that his humorous production, the New Bath Guide, was published, which at once became highly popular. He also wrote an Elegy on the Death of the Marquis of Tavistock, 1767; The Patriot, 1768; An Election Ball, 1776; A. C. W. Bamfylde, Arm. Epistola, 1777; Envy, 1778; Charity, 1779; all of which, with many other productions, are collected in a splendid edition of his entire works, edited by his son, with a judicious sketch of his life. He died at Bath in 1805, in his eighty-first year.—*Life by his Son.*

ANSTIS (John), an English antiquary, was

born at St. Neot's in Cornwall, in 1669. He was educated at Oxford, from whence he removed to the Inner Temple. In 1702 he represented the borough of St. Germains in parliament. In 1714 he received the appointment of Garter king at arms, which he held till his death in 1744. He published, 1. A Letter on the Honour of the Earl Marshal, 8vo. 1706; 2. The Form of the Installation of the Garter, 8vo. 1720; 3. The Register of the most noble Order of the Garter, 2 vols. fol. 1724; and, 4. Observations introductory to an Historical Essay on the Knighthood of the Bath, 4to. 1725.

Anstis (John), son of the above, was educated at Corpus Christi college, Oxford, and took the degree of LL.D. He was joined with his father in the office of Garter; and in 1725 he obtained the post of genealogist, and register of the Bath. He died in 1754.

ANSTRUTHER Easter, a parish of Scotland, in the county of Fife, situated between those of Kilrennie and Anstruther Wester. Though episcopacy has long been abolished, part of the minister's stipend arises from the tithes of the fish caught on the coast.

Anstruther Easter, a royal burgh of Scotland, situated on the south-east coast of Fife, in the parish above-mentioned, twenty-six miles north-east from Edinburgh. A custom-house was established in it in 1710, and a new quay was built in 1753. Ship-building is carried on to a considerable extent in it. It has also a thread manufacture.

Anstruther Wester, a parish of Scotland, on the south-east coast of Fifeshire, seated in a valley, whence the name of both the parishes and the boroughs; struther, in the Celtic language, signifying a valley. It contains about 540 acres of arable land, and seven or eight of common. A small river divides it from Anstruther Easter. Though the air is moist, the climate is healthy; and, although the soil neither agrees with a wet nor a dry season, it yields considerable crops in favourable weather; so that, besides maintaining the inhabitants, quantities of wheat, barley, and beans are exported; though they are obliged to import oats, which do not agree with the soil. Agriculture, and the breed of cattle, are much improved.

Anstruther Wester is a royal borough of Scotland, situated in the above parish, on the south-east coast of Fife, about twenty-five miles from Edinburgh. Its charters of erection are dated 1554 and 1583. It suffered much during the civil wars in 1645; as well as by an inundation of the sea in 1670, which choked up the harbour, washed away the bulwarks, and rendered many of the houses uninhabitable. A similar inundation happened about the end of last century, which destroyed about a third part of the town. But the Union, however advantageous to Scotland in general, hurt Anstruther, and most of the towns situated on the coast of Fife, as much, if not more than either wars or inundations, as it almost totally annihilated their trade. Before the Union, the two Anstruthers had twenty-four ships, and thirty fishing-boats, employed in the fishery; whereas in 1764 there were only three ships of forty tons burden, and five boats belonging to both. It had, however, revived considerably before 1792, for there were then twenty ships, and ninety-four men employed by the two towns; of which six were engaged in the foreign trade, thirteen in the coasting, and one in the fishery; and whose tonnage amounted to 1172 tons. Of these, eight ships, of 552 tons, and thirty-six men, belonged to Anstruther Wester. This burgh is governed by three bailiffs, a treasurer, and an uncertain number of counsellors. The two towns have three fairs, on the first Tuesday after the 11th of April, 5th July and 12th November. Lon. 2° 25′ W. lat. 56° 20′ N.

ANSWER, *v.* & *n.* } Of unsettled etymo-
An'swerer, } logy; Goth. andswor,
An'swerable, } Sax. anꝑaiꝑan; Dan.
An'swerably, } answarer. To reply to
An'swerableness. } a question, objection, or any thing asserted. To justify, to satisfy expectations.

He went to þe kyng of France, and schewed him his resons;
þorgh þer ordenance þer duzepers gaf respons.
Bifore Sir William þe duzepers gaf *ansuere*.
R. Brunne, p. 141.

Thy profession is of hygh excellencye, but to frame thyself *answerably* like vnto it, thou hast nede much diligently to watche about thee.
Udall, Paul to Timothie, c. vi.

The silver sounding instruments did meet,
With the base murmur of the water's fall;
The water's fall with difference discreet,
Now soft, now loud, unto the wind did call,
The gently warbling wind low *answering* to all.
Spenser.

What is truth? said jesting Pilate; and would not stay for an *answer*. *Bacon's Essays.*

Goodness *answers* to the theological virtue charity, and admits no excess but error. *Id.*

It was a right *answer* of the physician to his patient, that had sore eyes: If you have more pleasure in wine than your sight, wine is good. *Locke.*

How can we think of appearing at that tribunal, without being able to give a ready *answer* to the questions, which he shall then put to us, about the poor and the afflicted, the hungry and the naked, the sick and imprisoned? *Atterbury.*

How they have been since received, and so well improved, let those *answer* either to God or man, who have been the authors and promoters of such wise council. *Temple.*

It is very unfair in any writer to employ ignorance and malice together; because it gives his *answerer* double work. *Swift.*

I know your mind, and I will satisfy it; neither will I do it like a niggardly *answerer*, going no further than the bounds of the question. *Sidney.*

There can be no merit, no recompense, *answerable* to a good man's prayer. *Hall's Contemplations.*

If I pay money to a banker's servant, the banker is *answerable* for it; if I pay it to a clergyman's or a physician's servant, whose usual business it is not to receive money for his master, and he embezzles it, I must pay it over again.
Blackstone's Commentaries.

That he might render the execution of justice strict and regular, Alfred divided all England into counties; these counties he sub-divided into hundreds, and these hundreds into tithings. Every householder was *answerable* for the behaviour of his family and his slaves, and even of his guests if they lived above three days in his house. *Hume.*

The blackbird whistles from the thorny brake,
The mellow bulfinch *answers* from the grove.
Thomson.

When a man asks me a question, I have it in my power to *answer*, or be silent; to *answer* softly or roughly, in terms of respect, or in terms of contempt.
Beattie's Essay on Truth.

ANSWER. in music, a term used in the construction of fuges, denoting the entrance or introduction of a subject by another part after the first; but this term more particularly applies to the counter fuge, denoting the introduction of the subject by inversion.

ANT', *n.* } Contracted and corrupted from
ANT'-HILL. } Ang.-Sax. Emett, Amet, furnished, provided, from the verb Ametan.

We 'll set thee to school to an *ant*, to teach thee there is no labouring in the winter. *Shakspeare.*

Methinks, all cities now but ant-hills be,
Where, when the several labourers I see,
For children, house, provision, taking pain,
They 're all but *ants*, carrying eggs, straw, and grain.
Donne.

On ev'ry side are seen descending down,
Thick swarms of souldiers loaden from the town;
Thus, in battalia, march embody'd *ants*,
Fearful of winter, and of future wants;
T' invade the corn, and to their cells convey
The plunder'd forrage of their yellow prey;
The sable troops, along the narrow tracks,
Scarce bear the weighty burthen on their backs.
Some set their shoulders to the pond'rous grain;
Some guard the spoil, some lash the lagging train;
And ply their several tasks, and equal toil sustain.
Dryden.

Learn each small people's genius, policies;
The *ants'* republic, and the realm of bees. *Pope.*

Put blue flowers into an *ant-hill*, they will be stained with red; because the ants drop upon them their stinging liquor, which hath the effect of oil of vitriol.
Ray.

ANT, or emmet, in entomology, the formica of Linnæus, a gregarious and most industrious tribe of insects, whose habits have in all ages attracted the attention and admiration of mankind. Like many other hymenopterous insects, ants have a three-fold distinction of sex; or rather are male, female, and neuter, or of no sex—a peculiarity never yet observed in any other department of the animal, and wholly unknown to the vegetable kingdom. The neuters exercise all the ordinary offices necessary for the existence and welfare of the community to which they belong; it is they who collect supplies of food, who explore the country for this purpose, and seize upon every animal substance, whether living or dead, which they can lay hold of, and transport to the common abode of the tribe. It is they who construct every part of the dwelling-place, who attend the hatching of the eggs, the feeding of the larvæ, and their removal to different situations, as occasion may require, and who conduct all the operations both of offensive and defensive warfare; in fact, all the laborious and perilous duties of this singular commonwealth. There is every reason, however, to believe that the helots and females of this tribe of insects are originally and substantially of the same sex, and that the development of the sexual organs in the latter is the consequence of some difference in the circumstances in which the larva is placed during its growth. In all the features of internal structure the supposed neuters agree with the female, and in the number of articulations composing the antennæ. Thus we find thirteen in the male, twelve only in the female, and twelve in the neuter. In the male ant the abdomen has seven rings, in the female and neuter only six. In the two latter classes the head is broader and the mandibles very large and powerful compared with those of the male, and furnished with serrated edges, and a sharp and often hooked point. The external sexual organs of the female and of the neuter are so nearly similar in appearance, that Latreille declares he was unable to perceive the least difference between them. On the other hand it is to be observed, that in the neuter the principal deviation from the model of the female consists in the absence of wings—a circumstance which may be conceived to be connected with a certain condition of the sexual organs, as are the horns of deer and the beard of men.

Ants certainly possess a greater share of muscular strength than almost any other insect of the same size. Of this we are witnesses from childhood in the incessant toil which they undergo, and the great loads they are seen to carry, often exceeding ten or twelve times their own weight. This apparently is continued with a corresponding share of sensation, seen in their great susceptibility to all changes of temperature, to moisture, and other conditions of the atmosphere. In the perfection of their sight they are also remarkable; the males and females being provided with both the descriptions of eyes peculiar to this class, namely, the composite and the simple eyes. The labouring ants, indeed, who never fly, are frequently destitute of the latter kind. Latreille describes two species of ants in which he could not discover the least appearance whatsoever of eyes, although he employed a high magnifying power in examining them. One of these (the formica cæca) is a foreign species, inhabiting the forests of Guiana, and of which the history is therefore little known. The other (the formica contracta) is met with in the vicinity of Paris. These interesting creatures possess also considerable acuteness of smell which appears to be useful not only in directing them to their food, but also, as Bonnet first remarked, in enabling them to follow by the scent the track of their companions. If the end of the finger be passed two or three times across the line of their march, so as to brush off the odorous particles with which the ants who have already passed that way may have impregnated the track, those who follow immediately stop on arriving at the place where the experiment has been made, and afterwards direct their course irregularly, till they have passed over the space touched by the finger, when they soon find the path, and proceed with the same confidence as before. Bonnet repeated this experiment frequently always with the same result. Latreille has endeavoured to discover the seat of smell, which had long been suspected to reside in the antennæ. He, with this view, deprived several labourer ants of these organs, and replaced them on their nests. When thus mutilated, they wander

to and fro in all directions as if they were delirious, and utterly unconscious of where they were going. Some of their companions were seen to notice their distress, and approaching them with apparent compassion, applied their tongues to the bleeding wounds of the sufferers, and anointed them with a liquor which they caused to flow from their own mouths. This trait of sensibility was repeatedly witnessed by Latreille, while he was observing their actions with a magnifying lens.

In all insects the antennæ are organs evidently of the greatest utility in conveying impressions from external objects. But in the ant, independently of their importance as organs of touch, they appear to be of still greater consequence, by being the chief instruments which enable them to communicate to one another intelligence in which they are mutually interested, and on which they are called upon to act. Mr. Huber, to whom we are indebted for a variety of curious observations on this subject, has given the name of Language Antennal to this species of intercourse. The situation of the antennæ, which are placed in front of the head, their great mobility, their peculiar mechanism, which presents a series of phalanges having great freedom of play, and endowed with exquisite sensibility, conspire to fit them admirably for the function which he assigns to them—that of producing a variety of different impressions, when applied in different ways to the antennæ, or other parts of those ants, with which they come in contact. Thus the signal of danger, which consists in the ant which gives the alarm striking its head against the corselet of the other, is propagated from ant to ant with astonishing quickness, throughout the whole society. For a few minutes a general ferment prevails, as if they were deliberating what measures to pursue; but their resolution is soon formed, and they are ready to rush in a body against the enemy. Any small animal that is discovered to have insolently invaded their repose, is certain of falling a victim to their resentment; unless he can make a precipitate retreat, which he seldom effects without being covered with the bites of these furious insects. They are not, however, equally jealous of the intrusion of every kind of insect, for wood-lice are often found in the interior of the nest, to whom, according to Latreille, they offer no molestation. Ants appear to be incapable of emitting sounds, so as to communicate with one another at a distance; and there is indeed, no evidence that they possess the sense of hearing.

Many erroneous opinions are prevalent with regard to the food of ants, which have often been supposed to consume corn, and to do great injury to plants by devouring their roots or stems. The truth is, that they are chiefly carnivorous insects, preying indiscriminately on all the softer parts of animals, and especially the viscera of other insects, whom they will often attack when alive, and overpower by dint of numbers, upon which they devour their victim on the spot, or drag him prisoner into their nests; or if the game should be too bulky to be easily transported, they make a plentiful meal, and exert like the bee a power of disgorging a portion, and of imparting it to their companions at home. It appears that they are even able to retain at pleasure the nutritious juices unchanged for a considerable time. The rapidity with which they consume, and in fact anatomise the carcasses of any small bird or quadruped that happens to fall in their way, is well known; and furnishes an easy method of obtaining natural skeletons of these animals, by placing their dead bodies in the vicinity of a populous ant-hill. In hot climates, where they multiply to an amazing extent, their voracity and boldness increase with their numbers. Bosman, in his description of Guinea, states that in one night they will devour a sheep, leaving it a fine skeleton; while a fowl is for them only the amusement of an hour. In these situations they will venture to attack even living animals of considerable size. Rats and mice often become their victims. The sugar-ants of Granada cleared every plantation which they visited of rats and other vermin, which they probably effected by attacking their young. Poultry, or other small stock, could not be raised without the greatest difficulty; and the eyes, nose, and other emunctories of the bodies of dying or dead animals, were instantly covered with them. They generally, indeed, begin their attacks on the most sensible parts, which have the finest cuticle: and accumulating in great numbers about the nostrils, destroy the animal by interrupting respiration. Negroes with sores had difficulty in keeping the ants from assailing them. Their power of destruction keeping pace with their increase of numbers, it is hardly possible to assign limits to either; and the united hosts of this diminutive insect have often become formidable to man himself. A story is related by Prevost, in his Histoire Général des Voyages, of an Italian missionary resident in Congo, who was awaked by his negroes in great alarm at the house being invaded by an immense army of ants, which poured in like a torrent, and before he could rise had already mounted on his legs. They covered the floors and passages, forming a stratum of considerable depth. Nothing but fire was capable of arresting their progress. He states that cows have been known to be devoured in their stalls by these daring devastators. Smith, in his Voyages to Guinea, reports that at Cape Corse the castle was attacked by legions of ants, who were preceded by thirty or forty, apparently acting as guides. It was at day-break when they made this incursion, entering first by a chapel, on the floor of which some negro servants were lying. Assailed by this new enemy, they fled with precipitation, and gave the alarm to their master, who, on awaking, could hardly recover from his astonishment at beholding the advancing multitude, which extended for a quarter of a mile before him. There was not much time for deliberation; and a happy expedient was adopted of putting a long train of gunpowder across the line of their march, and extending it to their flanks, which had already began to deploy, and setting fire to the whole, millions were destroyed at one blow; which so intimidated the rest, that the whole army retreated in disorder, and did not renew the attack. At Sierra

Leone the travelling ants, or marchers as they are called, will sometimes approach the settlements in lines of two or three miles long; they will cross considerable streams; and, entering a house, are perfectly irresistible except by fire. But even this, many of the inhabitants find it impossible to employ, and allow them to pass through, which they will do in a comparatively short time, clearing the apartments they enter of all other insects.

Ant-hills of immense size are described by travellers who have visited tropical regions. Campbell (author of Travels in South Africa, published in 1815) observed in the district of Albany, at the Cape, an ant-hill five feet high and twelve in circumference. In the forests of Guiana, according to M. Malouet, they attain the height of from fifteen to twenty feet, resembling the rude huts of savages; but containing a race more ferocious than the savage or the tiger himself: for they cannot be approached by men without the utmost danger of being devoured. The new settlers, who, in clearing the country, meet with any of these in their progress, immediately desist from their task, and even abandon the neighbourhood unless they can speedily destroy this formidable enemy. The only method of accomplishing this, is to dig a trench all round the ant-hills, and after having filled it with dry wood, and set fire to it on every side by lighting it quickly in different places, to cut off all retreat to the ants, and batter down the edifice.

The only vegetable substance which seems alluring to their appetite is sugar. They not only eat it in substance, but are fond of all fluids that contain it, such as the secretions which exude from many trees, and compose what has been termed the honey-dew; and the saccharine juice, which is excreted from the bodies of many of the insects belonging to the genus aphis. This latter species of food they appear to relish above all others; it resembles honey in its qualities, and is sucked with avidity from the insect which yields it, and which appears in no respect to suffer from the operation. Boissier de Sauvages was the first who noticed this singular fact; and Mr. P. Huber has ascertained a number of curious circumstances attending it. He conceives that the liquor is given out voluntarily by the aphis, at the solicitation of the ant, who for this purpose strikes it gently and repeatedly with its antennæ, using the same motions as it does when caressing its young; and remarks that the aphis retains this liquor for a longer time where the ants are not at hand to receive it. A single aphis may often be seen surrounded by three or four ants, who are feeding on the honey, and deriving from it a plentiful meal. It does not appear that the aphis uses any exertion to avoid the ants, who are thus dependant on its bounty; for those provided with wings, which would easily enable them to escape, are quite as passive under these circumstances as the rest. Ripe fruits are often attacked by ants on account of the sugar they contain; and for the same reason the buds of trees are infested with these insects: but there is no evidence that they at any time feed upon corn or vegetable seed. This point has been well established by Mr Gould; and Bonnet, who kept a colony of ants prisoners in his study, observed that however long they had been kept without food they never touched the corn that he put before them. Honey and sweetmeats have strong attractions for ants, who, if they once discover their way to a magazine of these dainties, will immediately communicate the tidings to the rest of the society, and, leading them to the spot, a regular path will soon be established, which will continue to be crowded with a train of depredators so long as any thing remains to be pilfered. It is however certain, notwithstanding the assertion of Bomare, who compares them to the miser, whose chief pleasure consists in contemplating the riches he has amassed in his coffers, that ants are not in the habit of hoarding provisions for future consumption. They grow torpid when the cold exceeds 27° of Fahrenheit, and in that state require no food, and the aphis affords them sufficient nourishment at other periods of the winter.

In the construction of their nests, each species of ant employs different materials, and follows its own peculiar mode of construction. Many form them of clay, and particularly the smaller species; one set building up a regular series of apartments in successive stories, often forty in number, with materials which are furnished to them by another set of workers, who are excavating the ground. The ceilings are supported throughout by small pillars in some parts, and by vertical walls in others; while broad arches are in other places raised, in order to protect larger spaces, and to admit of lengthened passages of communication throughout a long extent of apartments. These ants proceed in their building only at such times as the earth has been softened by rain or dew, and the atmosphere is at the same time sufficiently moist to allow of the materials cohering firmly before they dry; and such are probably the ants which Pliny mentions as working by moon-light. On one occasion, when the ants, under the inspection of Mr. Huber, had discontinued their labours on account of too great dryness in the atmosphere, he succeeded in getting them to renew their operations by sprinkling water upon them with a wet brush, in imitation of a natural shower. These insects close the doors of their habitations every night, in order to prevent the intrusion of others; and a few are said to remain on the outside during the night as sentinels. Some ants collect fragments of leaves, bark, or straw, with which they construct more permanent and artificially constructed nests than the former. Others employ the fine powder which they collect from decayed wood; and some for greater security establish themselves under a large stone, or in the crevices of decayed buildings. Many tribes of ants, on the other hand, penetrate into the solid substance of wood, which they scoop out into numerous cells, leaving only such thin intermediate partitions as would crumble into powder when pressed externally; but which will support their fabric.

The fœcundation of the ant is effected very generally during the flight of the females, in which they are accompanied by the males; both

appearing to be provided with wings chiefly for this object. A certain number of impregnated females are also, by the assistance of their wings, enabled to reach distant situations, where they become respectively the founders of new colonies; while the males, having fulfilled the office for which nature had destined them, are left to perish on the spot where they descend, being removed from those who formerly administered to them food, and being destitute of the means of procuring subsistence for themselves. Swarms of ants, of immense size, are occasionally met with; some have been recorded of such prodigious magnitude as to darken the air like a thick cloud, and to cover the ground where they settled to a considerable extent. Mr. Gleditsh, in the History of the Berlin Academy for 1749, describes shoals of a small black ant, which appeared in Germany, and formed high columns in the air, rising to a vast height, and agitated with a curious intestine motion, somewhat resembling the Aurora Borealis. A similar flight of ants is spoken of by Mr. Acolutte, a clergyman of Breslaw, which resembled columns of smoke, and which fell on the churches and the tops of the houses, where the ants could be gathered by handfuls. In the German Ephemerides Dr. Charles Rayger gives an account of a large swarm, which passed over the town of Posen, and was directing its course towards the Danube. The whole town was strewed with ants, so that it was impossible to walk without trampling on thirty or forty at every step. And more recently, Mr. Dorthes, in the Journal de Physique for 1790, relates the appearance of a similar phenomenon at Montpelier. The shoals moved about in different directions, having a singular intestine motion in each column, and also a general rotatory motion. About sunset they all fell to the ground; and were found on examination to belong to the formica nigra of Linnæus.

The infant colonies consist of very small numbers, and are perhaps wholly the offspring of a common parent, who has migrated alone, or with but a few companions. A number of impregnated females alighting in the neighbourhood of the nest, are laid hold of by the labouring ants, who immediately deprive them of their wings, and drag them to the nest, where they keep them prisoners till they deposit their eggs. She is in the interim respectfully attended by a numerous retinue of labourers, who are solicitous to anticipate all her wants. When first deposited, the eggs are very small, but become considerably larger before the larva is excluded; being apparently nourished by absorption; for the ants, to whose care they are confided, are continually licking them with their tongues. At the end of a fortnight the larva comes forth, and appears in the form of a transparent maggot, with a head and wings, but without any external organs of motion. They are now fed by their nurses, with a fluid disgorged from their stomachs; and in the course of their whole transformation to the state of nympha, and of perfect insect, are still dependant upon their assistance.

Almost incredible instances of sagacity have been related of different tribes of ants. Some, according to Huber, who are fond of the honey which exudes from the aphis, convey many of these insects into their own nests, lodge them near the vegetables on which they feed, but assign them distinct apartments in the recesses of their dwellings, and keep them close prisoners. As if conscious of the future advantages they may derive from these insects, they collect their eggs, and superintend their hatching with the same care which they bestow on their own.

Scenes of ferocious contention are occasionally exhibited between the inhabitants of neighbouring nests, and tend to check their otherwise excessive increase of number. Their weapons of offence are the jaws, (which are capable of inflicting a deep bite,) and in some species a sting, after using which they instil into the wound a highly acrid liquor. This liquor is well known to possess acid properties, and was long supposed by chemists to contain a peculiar acid, which was denominated the Formic; but it has been shown by Fourcroy and Vauquelin to consist of the acetic and malic acids, combined with a portion of acid animal matter, to which it owes its peculiar taste and smell. It is extremely volatile and pungent, and is capable of being thrown out by the ant, when irritated, in considerable quantities. Frogs have been killed by the vapour from an ant's nest in less than five minutes; and persons breathing it, when of a certain intensity, are nearly suffocated. The most daring and courageous species, such as that which M. Huber calls the Amazon-ant, make it the business of their lives to attack the nests of the weaker ants, and live by plundering them of their eggs and larvæ. These are hatched and reared by ants of the same species as themselves, who may be considered as auxiliaries to the Amazons, and who had themselves, at some former period, been kidnapped from their parent nest by the Amazons. Thus a society is formed among different species of insects, to which no parallel exists but in the human race.

The principal enemies of the ant are the ant-eaters, dasypus, and manis, or pangolin, who, with the tribe of wood-peckers, devour a very large proportion. The formica leonis, or myrmelion, feeds almost wholly on them. According to Mr. Campbell, the bees at the Cape frequently drive out the ants from their nests, of which they take possession. Ants are also infested by lice, which, as may well be imagined, are so minute as to be invisible without the assistance of a very high magnifying power: they are stated by Redi, who discovered them, to resemble in shape those of the fowl and the dove. Boiling water poured into their nests has been found the most effectual mode of destroying ants. The perfect insects, their eggs and larvæ, are thus scalded to death, and those who, being from home, escape their general catastrophe, finding it impossible to repair the loss, abandon the spot. The addition of soot or urine, or still better of tobacco, which may be infused in the water, will render it much more efficacious. A decoction of walnut-leaves, or lime-water, will also answer. Arsenic is exceedingly destructive to ants, and affords

another ready mode of getting rid of those that intrude into cupboards or pantries; it may, for this purpose, be mixed with sugar, or any kneaded kind of provision, and placed in the paths they frequent. Corrosive sublimate is also highly poisonous to them, and myriads of the sugar-ants at Granada have been destroyed by means of it. The ants become so outrageous, even when they only come in contact with the poison, that they frequently attack and destroy each other. The ancients often noticed the habits and economy of ants. Solomon sends the sluggard to them for a pattern: Aristotle and Pliny state that their labours are in a great measure regulated by the phases of the moon; and the latter mentions a species found in the northern parts of India, whose size was said to equal that of the wolves of Egypt, whose colour was the same as that of the cat, and whose occupation in winter consisted in digging up gold from the bowels of the earth; while the inhabitants in the summer robbed them of their treasures, after having decoyed them by stratagem from their nests. In later times, from the circumstance of the larvæ of ants bearing a resemblance to grains of corn, it has been confidently stated that these insects hoard up wheat as a provision for winter consumption. The form of the eggs and of the larvæ, and the attention paid to them by the ants, were described by Dr. King in the twenty-third number of the Philosophical Transactions; but Leuwenhoeck was the first who distinguished, with precision, the different forms which the insect successively assumes. He traced with care the changes from the egg to the larvæ, the nymph, and the perfect insect. Swammerdam pursued these successive developments with greater minuteness; and, unrivalled in the art of microscopic dissection, discovered the wonderful encasement of all the parts of the future ant at every preceding stage. Linnæus (Memoirs of the Royal Academy of Sciences at Stockholm, vol. ii.) ascertained some of the leading facts with regard to the distinction between the sexes, and determined that the ants which are furnished with wings, are the only individuals that exercise the sexual functions. Several particulars with regard to the economy of ants were published by Mr. Gould in a book entitled An Account of English Ants, of which an abstract is given in the Philosophical Transactions for 1747, by the Rev. Dr. Miles. The facts are here stated with tolerable correctness; but some errors have been committed by following too closely the analogy with bees. The most complete series of observations on the natural history of these insects, is that of the celebrated Swedish entomologist De Geer (Mémoires pour servir à l'Histoire des Insectes).

The Encyclopédie Méthodique has an able article 'Fourmi.' M. Barboteau, in the Journal de Physique, vols. ix. and x. Bonnet, in the second volume of his Observations sur les Insectes, and several modern French naturalists, have ably elucidated the habits of this curious insect. The most methodical account of them that has yet appeared, is that of Latreille, in his Histoire Naturelle des Fourmis, published at Paris in 1802; while perhaps the most copious collection of facts relative to the habits and economy of ants, is that of M. Huber, of Geneva, entitled Traité des Mœurs des Fourmis Indigénes, published in 1810. He contrived an apparatus which admitted of his obtaining a view, whenever he pleased, of the inmost recesses of their habitation; and was thus enabled to observe with minuteness some of the most important and interesting features of their history.

ANTAB, or AINTAB, a large town of Syria, supposed to be the ancient Antiochia ad Taurum in Comagena, constituted a small kingdom by the Romans. It is about three miles in circumference, situated on two hills, and the houses are built chiefly of stone. A small river, the Sejour, is conveyed to the higher parts by aqueducts, which branch out from above the town; and streams are thus made to run through the streets. The inhabitants, for the most part, live on the hills, and have their shops in the valley, which being built at the foot of the hill, with flat roofs, a passenger descends on them before he is aware. On the north side there is a strong castle on an artificial elevation, with a deep ditch surrounding, cut out of the rock; and within the fosse is a covered way, part of which is excavated, and the rest built and arched with stone. From this covered way the hill is cased all the way up with hewn stone also. The castle is garrisoned by a body of janissaries. On the south there is an extensive cemetery, which at a distance resembles large suburbs. Aintab is inhabited both by Mahommedans and Christians; the latter Armenians. They have a church here, and there are five principal mosques. The chief trade is in coarse-stamped calicoes and coloured woollens, leather and raw hides; and skins dyed red and yellow, into what is called Turkey leather. Aintab is governed by a mutselim appointed by the Porte. Many medals of the Syrian kings, and those of Cappadocia, are found in this town, which is between Bir and Aleppo; forty miles north of the latter, and 130 south-west of Diarbekir.

ANTACÆUS, in ichthyology, a name first given by Ælian and Strabo to the ichthyocolla piscis, the isinglass fish, or huso; and afterwards by Johnston and others, not only to this fish, but to the common sturgeon.

ANTACHATES is used by some naturalists for a kind of bituminous stone of the nature of amber, though of a different colour, which in burning yields a smell like myrrh.

ANTÆUS, in fabulous history, a giant of Libya, the son of Neptune and Terra. Designing to build a temple to his father, of men's skulls, he slew all he met; but Hercules fighting him, and perceiving the assistance he received from his mother (for by a touch of the earth he refreshed himself when weary), lifted him up from the ground, and squeezed him to death.

ANTAG'ONY, *n.* } Ἀντι, against, ἀγωνια,
ANTAG'ONIST, } agony. Contention, struggling one against another.
ANTAGONIS'TIC. }

PRAC. His valour will take cold, put on your double-
COM. His valour will keep cold, you are deceived;
And relish much the sweeter in your ears;
It may be too, in the ordinance of nature,

Their valours are not yet so combatant,
Or truly *antagonistic*, as to fight.
Ben Jonson's Mag. Lady, act iii, sc. 4.

Sir Francis Bacon observes, that a well written book, compared with its rivals and *antagonists*, is like Moses' serpent, that immediately ate and devoured those of the Egyptians. *Spectator*, No. 10.

As the controversies on every subject grew daily warmer, men united themselves more intimately with their friends, and separated themselves wider from their *antagonists*. *Hume's History of England.*

ANTAGONIST MUSCLES, in anatomy, those which have opposite functions; as flexors and extensors, abductors and adductors, &c.

ANTALGIC; from *αντι*, against, and *αλγος*, pain. That which softens pain; anodyne.

ANTALIUM, in natural history, a small sea-shell of a tubular form, whence it is also denominated tubulus marinus. The antalium, antale, or antalus, is about an inch and a half long; the thickness of a large quill at one end, and of a small one at the other; fluted from end to end, of a white or greenish white colour, is found on rocks, and at the bottom of the sea. It is alkaline, and said to be of some medicinal use as a resolvent and dryer, at least by the ancients. The antalium bears a near affinity, both in origin, structure, and use, with the dentalium.

ANTANACLASIS, (*αντανακλασις*, from *αντανακλαω*, to drive back.) 1. A figure in rhetoric, when the same word is repeated in a different, if not in a contrary signification; as, in thy youth learn some craft, that in old age thou mayest get thy living without craft. Craft, in the first place, signifies science or occupation; in the second, deceit or subtlety. 2. It is also a returning to the matter at the end of a long parenthesis; as, shall that heart (which does not only feel them, but hath all the motion of his life placed in them), shall that heart, I say, &c.—*Smith's Rhetoric.*

ANTANAGOGE; from *αντι*, and *αναγωγος*, contumacious; a figure in rhetoric, when, not being able to answer the accusation of the adversary, we return the charge by loading him with the same or other crimes; which is usually called recrimination.

ANTANDROS, an Æolian general, who founded the town of Antandros.

ANTANDROS, in ancient geography, a town of Mysia, on the sea-coast, at the foot of mount Alexandria. It was a town of the Leleges, anciently called Edonis, then Cimmeris, and now S. Dimitri.

ANTANISOPHYLLUM, in botany, hog-weed.

ANTAPHRODISIACS, in pharmacy, medicines proper to diminish the semen, and consequently to lessen the incitement to venery.

ANTAPOCHA, in the civil law, denotes one's acknowledgment in writing of money paid, in the way of rent, pension, interest, or the like incumbrance. Such instrument, or antapocha, the debtor gives upon making payment to the creditor, to serve as a proof of the charge or incumbrance for futurity, and exclude any claim of prescription against the payment of it. The antapocha differs from the apocha, in that this latter is given by the creditor to the debtor.

ANTAPODOSIS, in rhetoric, the counterpart, or latter clause of a similitude, answering to the former.

ANTARCTIC, *adj.* ARC'TIC. } *Αντι*, against, *αρκτος*, the bear. Opposite to the bear.

And of this world so round, within that rolling case
Two points there be that never move, but firmly kepe their place;
The 't one we se always, the 't other stands obiect
Against the same, dividing just the ground by line direct;
Which by imaginacion drawne from the one to th' other,
Toucheth the centre of the earth, for way there is none other,
And these be calde the poles, descride by starres not bright,
Artike the one northward we see, *antartike* th' other hight. *Wyatt*, p. 388.

Some pious drops the restless vagrants shed,
And now afresh their wing'd effusions spread
Askance, or cross the broad Pacific deep,
Obliquely north the floating squadrons sweep.
Still *arctic* ply to reach the frozen pole,
Now, hurried on, Sarmatian tempests roll.
Brooke's Univ. Beauty, book iv.

ANTARCTIC CIRCLE is one of the lesser circles of the sphere, parallel to the equator, at the distance of 23° 30′ from the south pole. It takes its name from its being opposite to another circle, parallel likewise to the equator, and at the same distance from the north pole, called the arctic circle. The stars near the antarctic pole never appear above our horizon.

ANTARCTICA, in entomology, a species of sphex, about the size of the common wasp. It is black, with ferruginous legs and antennæ; and inhabits the Cape of Good Hope.—*Gmelin.*

ANTARCTICA, in ornithology, a species of procellaria found within the antarctic circle. It is the antarctic petrel of Forster and Cook; petrel antarctique, ou damier brun, of Buffon; and petrel brun et blanc of Bongaino. Also a species of aptenodytes, called by Forster the antarctic penguin. It inhabits the South Sea from forty-eight degrees to the antarctic circle, and is frequently found on the icy mountains and islands in those regions, according to Foster, Ellis, and other naturalists.

ANTARCTICUS, in entomology, a species of tabanus that inhabits America.

ANTARES, in astronomy, the name of a star of the first magnitude, called also the scorpion's heart. Its longitude is 60° 13′ 14″ of Sagittarius; and its latitude 4° 31′ 26″ S.

ANTASTROPHE; from *αντι*, and *στρεφω*, I turn; in rhetoric, a species of anteposition.

ANTAVARE, a province of the island of Madagascar, lying about 21° 30′ S. lat. and bounded by the province and cape of Manousi. The greatest part of it is watered by the river Mananzari, whose source is in the red mountains of Ambohitsmene.

ANTE, a river of France, in the ci-devant province of Normandy, which rises beyond Falaise, and after a course of four miles falls into the Vire.

ANTE, in heraldry, denotes that the pieces are let into one another in such form as is there ex

pressed; for instance, by dove-tails, rounds, swallow-tails, or the like.

ANTEAMBULONES; from ante, before, and ambulo, to walk; in Roman antiquity, servants who went before persons of distinction to clear the way for them. They used this formula, 'Date locum domino meo,' i. e. Make way for my master.

ANTECANIS, in astronomy, the constellation otherwise called canis minor, or the star procyon. It is thus denominated as preceding, or being the forerunner of the canis major, and rising a little before it.

ANTECEDE', *v.*
ANTECE'DENCE,
ANTECE DENCY,
ANTECE'DENT, *n.* & *adj.*
ANTECED'ANEOUS,
ANTECES'SOR.

Ante, before, and *cedo*, to go: to go before. To precede is in more frequent use than antecede, and is employed in the same sense.

And th' *antecedent* shall you fynde as true when you rede ouer my letter as himself cannot say nay, but that the canscusyon is formal.
Sir Tho. More's Works, fol. 1115, c. 2.

The seventeen centuries since the birth of Christ are *antecedent* to the eighteenth, or the one which we live in; but it is the seventeenth only which we call the preceding one. *Trusler.*

Little attention was paid to literature by the Romans in the early and more martial ages. I read of no collections of books *antecedent* to those made by Emilius Paulus and Lucullus. *Cumberland.*

ANTECEDENCE, in astronomy, an apparent motion of a planet towards the west, or contrary to the order of the signs.

ANTECEDENT, in mathematics, is the first of two terms of a ratio, or that which is compared with the other.

ANTECEDENTS, in rhetoric, are such propositions as being once allowed, others necessarily or very probably follow. This is one of the sixteen topics, enumerated by Cicero and Quintilian.

ANTECEDENT SIGNS, in medicine, are such symptoms of disorder as appear before a distemper is so formed as to be reducible to any particular class, or proper denomination.

ANTECESSOR was an appellation given to those who excelled in any science. Justinian applied it particularly to professors of civil law; and, in the universities of France, the teachers of law, before the revolution, took the title antecessores in all their theses.

ANTECŒNIUM, in antiquity; from ante, and cœnum, supper; *προδειπνον*, a collation before supper, or the first course of supper, consisting of eggs, herbs, &c. customary among the Greeks and Romans.

ANTECURSORES, in the Roman armies, a party of horse detached before, partly to get intelligence, provisions, &c. and partly to choose a proper place to encamp in. These were also called antecessores, and by the Greeks prodromi.

ANTEDATE, *v.* & *n.* *Ante*, before; *do*, *datum*, given. To take beforehand, to fix a time for an event before it actually happens; to anticipate.

So we win of doubtful Fate:
And if good she to us meant,
We that good shall *antedate*;
Or if ill, that will prevent.
Andrew Marvell, in Ellis, v. iii. p. 297.

To doubt,
Is worse than to have lost; and to despair,
Is but to *antedate* those miseries,
That must fall on us.
Massinger's Duke of Milan, act i, sc. 2.

Andromache! my soul's far better part,
Why with untimely sorrow heaves thy heart?
No hostile hand can *antedate* my doom,
'Till fate condemns me to the silent tomb:—
Fix'd is the term of all the race of earth.
Pope. Iliad 6th. v. 624.

Our joys below it can improve,
And *antedate* the bliss above. *Pope.*

Now thou hast loved me one whole day;
To-morrow, when thou leav'st, what wilt thou say
Wert thou then *antedate* some new-made vow,
Or say, that now
We are not just those persons which we were?
Donne.

ANTEDATE, among lawyers, a spurious or false date prior to the true date of a bond, bill, or the like.

ANTEDILUVIAN.

ANTEDILU'VIAN, *n.* & *adj.* Lat. *ante*, against, prefixed to many words. A frequent prefix to words retaining its simple meaning, and modifying the annexed word with respect to time, or condition. *Ante*, before, and *diluvium* the deluge; from *diluo*, to wash away.

The sinners of the *antediluvian* world, abusing the long space of one hundred and twenty years which he allowed for their repentance, perished at the end of it without mercy. *Porteus's Lectures.*

A sickness that leads the way to everlasting life, is better than the health of an *antediluvian*.
Cowper's Letters.

ANTEDILUVIANS, in ancient history, a term usually applied to that part of the human race which existed before the flood; and whose religion, history, polity, chronology, and longevity have in all ages awakened feelings of interest in the intellectual part of mankind.

The religion of mankind even at this early period was at no time purely natural, as that of unassisted reason, but assumed three distinct features: 1. It was revealed. 2. It was sacrificial. 3. It was social and sabbatical. Traditions of this period have long vanished, but we have no authenticated instance of idolatry before the flood. The antediluvian sacrifices and formal institutions of worship no doubt bore the same relation to the New Testament as the ceremonial dispensations of the Jews, and shadowed forth the sacrifice of the son of God. In this view Abel's offering was considered a more excellent sacrifice than Cain's, Heb. xi. 4; or, according to Wickliffe's testament, 'a much

more sacrifice.' The acceptance of sacrifices was denoted by fire descending from heaven to consume it. Kennicott and others after Fagius, contend that in the history of Cain and Abel's sacrifices, מקץ ימים ought not to be rendered 'in process of time,' but 'at the appointed time or season.' So that although we have nowhere any express command till the time of Moses for the posterity of Adam to observe the Sabbath-day, it evidently was observed from the reason assigned Exod. xx. 11, as appears from the familiarity with which it was introduced into the Jewish law; also from the fact of a septennial division of time having obtained over many ancient nations, coeval in their origin with the Jews, but totally unconnected with them. Places of worship appear to be sanctioned by the term 'presence of the Lord,' which indicates that the divine presence was more distinctly manifested in some particular places than others; and the fact noticed Gen. iv. 'Then began men to call on the name of the Lord,' appears to argue both social and public religion, although Maimonides and other critics consider this as a profane calling upon the divine name, Lord.

The government, at least in the early part of antediluvian history, appears to have been patriarchal. The longevity of this period would strengthen the ties of kindred and the consequent claims of paternal authority. To be an outcast or a vagabond from such society constituted a formidable part of the punishment of Cain. This state of peace and harmony was interrupted by the mighty ones or tyrants that arose in the latter part of antediluvian history, whose rapine and oppression brought on the catastrophe of the deluge. These 'men of renown,' are variously described in the scripture by the appellation of, 1. נפלים, Nephalim—Naphal—fallen ones; apostates, γιγαντες, according to the LXX. literally earth-born. 2. גברים Gibborim—gabar—victorious heroes or conquerors. 3. אנשי השם—men of name, deriving surnames from their unworthy deeds—men not content with the simple family distinctions of their ancestors, and who, by their oppressions, destroyed that original order for which the early ages were remarkable.

With respect to the manners of the antediluvians, their happiness seems very remarkable during the early part of their history, and their licentiousness during the latter. The murder of Abel was however an awful instance of human depravity, but it is connected with a reflection on the general rectitude, 'every one that findeth me shall slay me.' Lamech, the fifth in descent from him, introduced polygamy.

The attainments of the antediluvians in the arts appear to have been considerable. The smelting of metals is mentioned, and a sort of community, who in the time of Tubal Cain, the seventh in descent from Adam, were artificers in brass and iron. In the same family we read of the successful cultivation of the science of music, and the terms used are probably generic; that which we render harp meaning all stringed instruments, and that which we call organ meaning all wind instruments. Cain built a city, and as he had been cursed in his former occupation of agriculture, appears to have cultivated the other arts in which his family became so proficient. Josephus mentions the skill of Seth in the science of astronomy; hieroglyphic pillars of his erection being, as that historian tells us, extant in his own time. The astrology of the Chaldeans perhaps arose from connecting with his observations, so far as they were perpetuated, a mythological superstition; and the Hindoo observations, recently known to us, argue a very early acquaintance with the heavens, and might possibly be derived from the same source. The successful cultivation of agriculture removed many a thorn from the lot of the antediluvians, and the posterity of Seth anticipated the eminence of Noah, perhaps with a view to his talents in this respect, Gen. v. 29. But the most unequivocal proof of the state of antediluvian science is found in the celebrated work of Noah, viz. the building of the ark. Allowing eighteen inches to the cubit, this vessel would be of the enormous burden of 42,413 tons, equal to that of eighteen of our first-rate ships of war, not to say that some authors, with at least a show of probability, calculate the cubit at twenty-two inches. To construct such a vessel as this, to arrange the vast and the minute of the mechanism, to ventilate, to enlighten, and to render it manageable, would argue in modern times some considerable acquaintance with ship-building. The ark, it must be remembered, rode the most awful storms that ever raged.

The final corruption of the antediluvians brought on this memorable event. The historian, after having traced the posterity of Cain to Lamech, Gen. iv. abandons that line of the family of Adam, and in the next chapter details the posterity of his third son, Seth, down as far as Noah. 'The sons of God,' mentioned in this text, were thought by the fathers to intend either angels or the dæmons of the heathen world, who were represented by Socrates as the fathers of the heroes, (apud Platon. Cratyl.) and as 'all of them born from love, either of a god with a mortal woman, or of mortal man with goddesses.' This pagan sentiment it was one great effort of the Jews to prove consistent with the Mosaic account of the early ages, nor were the Christian fathers in this respect far their inferiors. Dr. Wall and other late writers have imagined, that when men began to multiply upon the earth, 'the chief men took wives of all the handsome poor women that they chose,' and powerful men having unlawful intercourse with inferior women, the children of this illicit commerce were the heroes and gods of antiquity. Critics consider that the passage refers to the degenerate race of the pious Seth, forming matrimonial connexions with the family of Cain. The corruption at length became universal. Eutychus has preserved several traditions of the grossness of antediluvian licentiousness, and the Scriptures relate in general that they were eating, drinking, marrying, and giving in marriage, to the day that Noah entered into the ark.

With respect to the means by which a knowledge of the antediluvians was obtained by Moses the first sacred historian; Adam, it will be seen, died in the year of the world 930, and

was, therefore, fifty-six years contemporary with Lamech, the father of Noah; Shem, the son of Noah, would be fifty years contemporary with Isaac, and Isaac dying at 188, in the year of the world 2288, would be fifty-three years contemporary with Levi, the great-grandfather of Moses: so that all the knowledge perpetuated with respect to the antediluvians, would have to travel but through one single person, viz. Lamech to Noah.

The longevity of the antediluvians has, of late years, excited considerable attention. An absurd attempt has been made to consider the scriptural year lunar and not solar, but the year, as well ascertained by Dr. Hales and others, appears to have been reckoned at 360 days in all parts of the ancient world. Josephus and others are of opinion that this remarkable age fell to the lot of only a few individuals. Some have imputed it to the sobriety of the antediluvians and their simplicity of diet. Others again attribute it to the strength of the stamina, or first principles of their bodily constitution; whilst not a few ascribe it to the excellency or the purity of the earth, some peculiar virtue in the herbs and plants of those days, &c. The theory of Buffon, on the antediluvian longevity, is as follows: The surface of the globe was, in the first ages of the world, less solid and compact; because, gravity having acted only for a short time, terrestrial bodies had not acquired their present density and consistence. The produce of the earth, therefore, must have been analagous to its condition. The surface being more loose and moist, its productions would of course be more ductile and capable of extension: their growth therefore, and even that of the human body, would require a longer time of being completed. The softness and ductility of the bones, muscles, &c. would probably remain for a longer period, because every species of food was more soft and succulent. Hence the full expansion of the human body, or when it was capable of generating, must have required 120 or 130 years; and the duration of life would be in proportion to the time of growth, as is uniformly the case at present: for if we suppose the age of puberty among the first races of men to have been 130 years, as they now arrive at that age in fourteen years, the age of the antediluvians will be in exact proportion to that of the present race; since, by multiplying these two numbers by seven, for example, the age of the present race will be ninety, and that of the antediluvians will be 910. The period of man's existence, therefore, may have gradually diminished in proportion as the surface of the earth acquired more solidity by the constant action of gravity; and it is probable, that the period from the creation to the days of David, was sufficient to give the earth all the density it was capable of receiving from the influence of gravitation; and consequently that the surface has ever since remained in the same state, and the terms of growth in the productions of the earth, as well as the duration of life, have been invariably fixed from that period.

The longevity of the antediluvians, it will be readily perceived, bears upon the important question of population, on the probable amount of which numerous opinions have been formed. The length of the lives of the antediluvians exceeding the present standard in the proportion of ten to one, the human family must then have doubled themselves in one-tenth part of the time required for that purpose at present. Allowing this, the number of mankind would easily amount to upwards of one hundred thousand millions, even according to the Samaritan chronology. The following table on these principles, drawn up by Mr. Whiston, exhibits one calculation of the numbers of people in the ancient world.

Number of Mankind.	Year of the world.	Year of doubling.	Series.
4	2	2	1
8	6	4	2
16	12	6	3
32	20	8	4
64	30	10	5
128	42	12	6
256	56	14	7
512	72	16	8
1024	90	18	9
2048	110	20	10
4096	132	22	11
8192	156	24	12
16,384	182	26	13
32,768	210	28	14
65,536	240	30	15
131,072	272	32	16
262,144	306	34	17
524,288	342	36	18
1,048,576	380	38	19
2,097,152	420	40	20
4,194,304	462	42	21
8,388,608	506	44	22
16,777,216	552	46	23
33,554,432	600	48	24
67,108,864	650	50	25
134,217,728	702	52	26
268,435,456	756	54	27
536,870,912	812	56	28
1,073,741,824	870	58	29
2,147,483,648	930	60	30
4,294,967,296	992	62	31
8,589,934,592	1056	64	32
17,179,869,184	1122	66	33
34,359,738,368	1190	68	34
68,719,476,736	1260	70	35
137,438,953,472	1332	72	36
274,877,906,944	1406	74	37
549,755,813,888	1482	76	38

Mr. Cockburn objects to the above calculations of Mr. Whiston, on the following grounds: 1. It is laid down as a fundamental principle, that the antediluvians would double themselves every forty years. This, he observes, would have been the case after there came to be 100 marriages, a progression which if the author had observed in his computation, by adding forty years to every former period of the age of the world, the amount at the year 1656, the age of the world at the deluge, according to the

Hebrew writers, which he contends for, instead of two millions of millions, &c. would have been above five millions of millions. 2. It is supposed that the period of doubling must have been much shorter in the earliest ages, and much longer in the latter, which is contrary to reason and fact. 3. The period of puberty, and the time of nursing are quite overlooked. The periods of puberty and the time of gestation, &c. this author contends bear a just proportion to the length or shortness of human life; and on this principle, he considers that the antediluvians would be mere youths at the age of 150 or 160 years, that period bearing much the same proportion to the extent of their lives as twenty does to ours. After much ingenious reasoning, he gives the following tables, the first of which is brought down to the year 2050, and the second to the year 2020: the remaining portion of time to the flood, according to the first table, 206 years, and according to the second, 236, he considers would afford no proportionate increase, owing to the violence and oppression in the earth.

TABLE I.

Years of the World.	Number of Mankind.
500	200
550	400
600	800
650	1600
700	3200
750	6400
800	12,800
850	25,600
900	51,200
950	102,400
1000	204,800
1050	409,600
1100	819,200
1150	1,638,400
1200	3,276,800
1250	6,553,600
1300	13,107,200
1350	26,214,400
1400	52,428,800
1450	104,857,600
1500	209,715,200
1550	419,430,400
1600	838,860,800
1650	1,677,721,600
1700	3,355,443,200
1750	6,710,886,400
1800	13,421,772,800
1850	26,843,545,600
1900	53,687,091,200
1950	107,374,182,400
2000	214,748,364,800
2050	429,496,729,600

TABLE II.

Years of the World.	Number of Mankind.
500	200
540	400
580	800
620	1600
660	3200
700	6400
740	12,800
780	25,600
820	51,200
860	102,400
900	204,800
940	409,600
980	819,200
1020	1,638,400
1060	3,276,800
1100	6,553,600
1140	13,107,200
1180	26,214,400
1220	52,428,800
1260	104,857,600
1300	209,715,200
1340	419,430,400
1380	838,860,800
1420	1,677,721,600
1460	3,355,443,200
1500	6,710,886,400
1540	13,421,772,800
1580	26,843,545,600
1620	53,687,091,200
1660	107,374,182,400
1700	214,748,364,800
1740	429,496,729,600
1780	858,993,459,200
1820	1,717,986,918,400
1860	3,435,973,836,800
1900	6,871,947,673,600
1940	13,743,895,347,200
1980	27,487,790,694,400
2020	54,975,581,388,800

Burnet, in his Theory of the Earth, has supposed that the first human pair might have left at the end of the first century, ten married couples, and from these, allowing them to multiply in the same decuple proportion as the first pair did, would rise in 150 years a greater number of persons than the earth was capable of holding. He, therefore, suggests a quadruple multiplication only, and then exhibits the following table of increase during the first sixteen centuries, which, according to the chronology of archbishop Usher, preceded the flood.

I.	10
II.	40
III.	160
IV.	640
V.	2560
VI.	10,240
VII.	40,960
VIII.	163,840
IX.	655,360
X.	2,621,440
XI.	10,485,760
XII.	41,943,040
XIII.	167,142,160
XIV.	671,088,640
XV.	2,684,354,560
XVI.	10,737,418,240

The calculation, though the most moderate that has ever been made upon the subject, exceeds the highest calculation of the present number of mankind, which, we believe, has never been supposed to amount to more than from eight hundred to one thousand millions.

The common epoch of the deluge has been of late controverted with much apparent success in the laborious work of Dr. Hales on Chronology. Having produced 120 different opinions respecting the epoch of the Mosaic cosmogony, and reviewed the most celebrated systems of chronology, ancient and modern, this author finally suggests the year B. C. 5411, as the period of the formation of the world; and that of B. C. 3155, as the epoch of the deluge. The authors of the Universal History had previously rejected the Usherian period, and preferred that of the Samaritan Hebrew text, which adds 650 years to the common date; but the principal opinions brought together by Dr. Hales, in the following table, will be seen to differ in their extremes almost to the amount of the entire era of the antediluvian world according to that date:

Epochs of the Deluge.	B. C.
Septuagint Version	3246
Jackson	3170
Hales	3155
Josephus	2146
Persian	3103
Hindoo	3102
Samaritan	2998
Howard	2698
Playfair	2352
Usher and English Bible	2348
Marsham	2344
Petavius	2329
Strauchius	2293
Hebrew	2288
Vulgar Jewish	2104

Dr. Hales, it will be seen, approaches much nearer to the Septuagint than the Hebrew calculation, which latter is the foundation of the Usherian chronology. He founds the basis of his chronological system on the harmonised chronology of Josephus and Theophilus bishop of Antioch, A. D. 168; finding his punctum stans in the birth of Cyrus, B. C. 599, which led to his accession to the Persian throne, B. C. 559; of Media, B. C. 551; and of Babylonia, B. C. 536; 'For from these several dates,' he adds, 'carefully and critically ascertained and verified, the several and respective chronologies of these kingdoms branched off; and from the last especially, the destruction of Solomon's temple by Nebuchadnezzar, B. C. 586, its correcter date, which led to its foundation, B. C. 1627; thence to the Exode, B. C. 1648; thence to Abraham's birth, B. C. 2153; thence to the reign of Nimrod, B. C. 2554; thence to the Deluge, B. C. 3155; thence to the creation, B. C. 5411.'

The Line of the Antediluvian Patriarchs

I. According to the Hebrew text.

	Began his life in the year of the world.	Had his son in the year of his life.	Lived after the birth of his son, years.	Lived in all, years.	Died in the year of the world.
Adam	1	130	800	930	930
Seth	130	105	807	912	1042
Enos	235	90	815	905	1140
Cainan	325	70	840	910	1235
Mahalaleel	395	65	830	895	1290
Jared	460	162	800	962	1422
Enoch	622	65	300	365	987
Methuselah	687	186	782	979	1656
Lamech	874	182	595	777	1651
Noah	1056	500			

II. According to the Samaritan text.

	Began his life in the year of the world.	Had his son in the year of his life.	Lived after his son's birth, years.	Lived in all, years.	Died in the year of the world.
Adam	1	130	800	930	930
Seth	130	105	807	912	1042
Enos	235	90	815	905	1140
Cainan	325	70	840	910	1235
Mahalaleel	395	65	830	895	1290
Jared	460	62	785	847	1307
Enoch	522	65	300	365	887
Methuselah	587	67	653	720	1307
Lamech	654	53	600	653	1307
Noah	707	500			

III. According to the Septuagint version.

	Began his life in the year of the world.	Had his son in the year of his life.	Lived after his son's birth, years.	Lived in all, years.	Died in the year of the world.
Adam	1	230	700	930	930
Seth	230	205	707	912	1042
Enos	435	190	715	905	1340
Cainan	625	170	740	910	1535
Mahalaleel	795	165	730	895	1690
Jared	960	162	800	962	1922
Enoch	1122	165	200	365	1487
Methuselah	1287	187	782	969	2256
Lamech	1474	188	565	753	2227
Noah	1662	500			

Dr. Hales has shown that there could be originally no difference between the Hebrew and Greek chronologies; since the computation of Josephus was, in his time, conformable to both; and consequently that the chronology of one or the other of the writings of Josephus must have been since adulterated. He alleges, on the authority of Ephraim Syrus, who died in the fourth century of the Christian era, that a great and designed alteration has taken place in the Hebrew text; a tradition being current, says Ephraim, that the Messiah should appear in the sixth millenary of the world: 'the Jews subtracted 600 years from the generations of Adam and Seth, &c. that their own books might not convict them upon the point.' According to Dr. Hales, the patriarchal lives of this period stand thus:

	Began his life in the year of the world.	Lived after the birth of his son, years.	Had his son in the year of his life.	Lived in all, years.	Died in the year of the world.
Adam	1	230	700	930	930
Seth	280	205	707	912	1442
Enos	435	190	715	905	1840
Cainan . . .	625	170	740	910	1534
Mahalaleel . .	795	165	730	895	1690
Jared	960	162	800	962	1922
Enoch	1122	165	200	365	1487
Methuselah . .	1287	187	782	969	2256
Lamech . . .	1747	182	*595 †564	*777 †753	*2251 †2227
Noah	1656	500			
Deluge . . .	2256	600			

* Heb. † LXX.

The confirmation which the sacred narrative receives from the testimony of Berosus, a Chaldean historian, is too important to be omitted. He first conveyed the astrology of his country into Greece; and fragments of two writing are preserved in Josephus, Tatian, and Eusebius; and Sanchroniathon, who is said to have composed a history of the Phœnicians, the first book of which only is extant, in Eusebius. Berosus gives an account of ten kings who reigned in Chaldea before the deluge, evidently corresponding with the ten patriarchs of the Old Testament. The first of them he calls Alorus, and the last Xisuthrus, whom he states to have received a revelation in a dream, that mankind would be destroyed by a flood, and to have been commanded to build a ship for his own preservation, that of his friends, and of certain fowls and four-footed beasts. The flood being survived by Xisuthrus and his companions, they sent out some birds on its abating, who at first returned quickly to the vessel; shortly after they were sent out a second time, and came back with mud on their feet; but being let go a third time, they returned no more. Understanding from this, that the earth was appearing above the waters, Xisuthrus is said to have taken up some of the planks of his vessel, and to have found that it had grounded on a mountain. Sanchoniathon, extolled as he is by Porphyry, and commented upon at great length by bishop Cumberland, has nothing equal to the distinctness of this short account. After a rambling cosmogony of the creation, he tells us that all mankind were the descendants of Protogenus and Æon, the latter of whom discovered the food that may be gathered from trees. Their children were Genus and Genea, who introduced the worship of the sun, calling him Beelsamen, the lord of heaven, on account of a memorable drought. Their offspring were Phos, Phor, and Phlox, or Light, Fire, and Flame, who first discovered the use of fire by rubbing two pieces of wood together; and had sons of vast stature, who gave their names to mounts Cassius, Libanus, Antilibanus, and Brathys. The children of these giants were Memrumus, Hypsuranius, and Usous; Hypsuranius being the inventor of huts made of reeds and rushes, and Usous the first worshipper of fire and wind. In the days of these latter chiefs, women first became licentious in their manners. The inventions of hunting, fishing, and working iron, are traced to various of their descendants until we come to Chrysor, who introduced all descriptions of fishing tackle, and first ventured out in a boat to sea, for which exploit he was deified. He goes on to trace the history of this family until he comes to Misor, the father of Troth or Taautus, the Mercury of the Egyptians, whom he notices to be eleven generations in descent from Protogenus; Moses makes twelve from Adam to Misraim, whom he places at the head of that nation. Sanchroniathon making no other mention of the flood than the exploit of Chrysor may be supposed to contain by way of an allusion.

ANTEJURAMENTUM, or PRÆJURAMENTUM, called also juramentum calumniæ; an oath which the accuser and the accused were anciently obliged to make before purgation, or the trial by ordeal; the one that he would prosecute the criminal, the other that he would defend his innocence. If the accuser failed, the accused was discharged; if the accused, he was accounted guilty, and was not admitted to purge himself by the ordeal.

ANTEJUSTINIANEAN, an appellation given to the ancient Roman law, as it stood before the time of the emperor Justinian.

ANTELABIA, in anatomy, the extremities o the lips.

ANTELIUS, or ANTHELIUS, Αντηλιος, Gr.

i. e. against, or exposed to the sun; in antiquity, an idol placed at the doors of houses, and supposed to have the guardianship or protection of them.

ANTELIX, in anatomy, that part of the ear which is opposite to the helix.

ANTELOPE, in zoology. See CAPRA.

ANTELUCAN, in ecclesiastical writers, is applied to things done in the night, or before the day: thus, antelucani cœtus, meetings of the ancient Christians in times of persecution for religious worship.

ANTELUDIA; from ante, and ludus, game; in antiquity, a day of show or parade preceding the circenses, wherein the preparations made for those solemnities were exposed with great pomp.

ANTEMURALE; from ante, and murus, a wall; in antiquity, a kind of outer wall environing the other works of a place, and preventing the too near access of the enemy to them. It is called by Isidore promurale, for the defence of the wall, and is used to denote any work without the rampart of a place; in which sense it amounts to the same with the counterscarp. In ecclesiastical writers it signifies the vestibule or entrance of the presbyterium, or bema.

ANTENATI, in English history, the subjects of Scotland born before the accession of James I. to the English crown and alive after it; those who were born after the accession being denominated postnati. The antenati were considered as aliens in England; the postnati claimed the privilege of natural subjects.

ANTENATUS is used for a son, the issue of a former marriage. Antenatus is also used in law-writers for the first-born.

ANTENCLEMA, in oratory, is where the whole defence of the person accused turns on criminating the accuser. Such is the celebrated defence of Milo by Cicero. See RECRIMINATION.

ANTENDEIXIS, in medicine, a contra-indication; when a turn takes place contrary to the first indication, as an inflammation indicates phlebotomy, but the weakness of the patient may be a contrary indication.

ANTENIMENES, a people inhabiting the south-east coast of Madagascar.

ANTENNÆ, in entomology, slender bodies with which nature has furnished the heads of insects, being the same with what are called horns or feeders. See ENTOMOLOGY.

ANTENOR, a Trojan prince, nearly related to Priam, who, after the destruction of Troy, came to Italy, expelled the Enganians on the river Po, and built the city of Antenoria, now called Padua, where his tomb is said still to be visible.

ANTEON, in zoology, a genus of insects of the order hymenoptera, and family proctotrupii. Its generic character is: antennæ of the male, ten articulations: abdomen depressed, ovate with a distinct abrupt peduncle: upper wings with a large, perfect, triangular areola, occupying the base, stigma broad.

ANTEPAGMENTA, in the ancient architecture, the jambs of a door. They are also ornaments in carved work, made either of wood or stone, and set on the architrave.

ANTEPANNI, or ANTIPANA, in antiquity, from the modern Greek *αντιπανα*; the band with which the anterior part of the garment was fastened.

ANTEPENULT; from *ante pæne ultimam*, (sc. syllabam); the syllable of a word before the last but one.

ANTEPILANI, among the ancient Romans, the hastati or principes of a legion. They are supposed to have been thus called because ranged before the pilani or triarii.

ANTEPILEPTICS, in medicine, are chiefly the roots of pœony, valerian, the flowers of the lime-tree, misletoe of the oak, opium, musk, camphor, æther, volatile alkali, and the aromatics in general: or remedies against the epilepsy.

ANTEPOSITION, a grammatical figure whereby a word which, by the ordinary rules of syntax ought to follow another, comes before it; as when the verb is put before the nominative, the substantive before the adjective, &c. This figure was frequent among the Greeks and Latins, whose language, by its variety of terminations, admitted of the artificial order without confounding the sense of the words; but in the English and most modern languages, where the natural order is necessarily used, it is very seldom adopted, except in such expressions as, said I, quoth he, and the like.

ANTEQUERA, a city of Andalusia, in the province of Seville in Spain, on the confines of Grenada; into which kingdom, when possessed by the Moors, it was the only accessible road on the western side. It is situated on the banks of the river Guadalhoree amidst stupendous masses of marble rocks, which elevate their heads far above the surface of the land, and beautiful streams of limpid water which irrigate and fructify the many small portions of land which are within their influence. It is of very ancient origin, was a Roman municipium in the time of Antoninus, and noted in his itinerary by the name of Antiquaria. It was a most important place during the preponderance of the Moorish power, and has been as often the theatre of those predatory wars which prevailed at that period, as any place in Spain. There are abundant remains of both the military invading nations to be seen, and the lover of antiquities here revels in the enjoyment of his favourite pursuits. At present it contains a population of 25,000 inhabitants, who chiefly depend on agriculture; though there are manufactures of baize and hats, each on a small scale. Near the city is an internal lake of salt water, four miles in length and two in breadth, where by the heat of the sun alone crystallisation is performed, and it supplies the inhabitants with that necessary of life, salt.

ANTERIDES, in the ancient architecture, buttresses erected to support a wall. They were also called antes, sometimes crismæ, and by the Greeks *ερεισματα*. They answer to what the modern builders call counterforts, archbutants, &c. and the Italians barbicane and speroni, or spurs.

ANTE'RIOR, } Anterior, the comparative
ANTERIOR'ITY. } degree of the Latin adverb *ante*. Formerly applied to time.

If that be the *anterior* or upper part, wherein the senses are placed, and that the posteriour and lower part which is opposite thereunto, there is no inferior or former part in this animal; for the senses, being placed at both extremes, make both ends *anterior*; which is impossible. *Brown's Vulgar Errors.*

But our poet (Homer) could not have seen the prophecy of Isaiah, because he lived 100 or 150 years before that prophet; and this *anteriority* of time makes this passage the more observable.

Pope's Iliad, xiv. note on line 93.

Among the many cavils that have been devised against the demonstrated existence of a first, intelligent, self-existent, Cause of all things, this has been one—that things known must be *anterior* to knowledge.

Bolingbroke's Essay on Human Knowledge.

ANTEROS, in mythology, one of the two principal Cupids. They are placed at the foot of the Venus of Medici; this is represented with a heavy and sullen look, agreeable to the poetical description of him as the cause of love's ceasing. The other was called Eros.

ANTEROTES, a name given by some of the ancient writers on gems to a species of the amethyst. Some think they meant by it a sort of opal; but Pliny expressly contradicts this, making the anterotes the fifth kind of amethyst in value.

ANTERY, or ANTARI, a large walled town of Agra, in a district of Hindostan, on the Dialoo, fourteen miles south of Gualior, belonging to the Mahratta territory. N. lat. 26° 16′, E., long. 78° 17′.

ANTESIGNANI, in the Roman armies, soldiers placed before the standards to defend them, according to Lipsius; but Cæsar and Livy mention the antesignani as the first line, or first body, of heavy armed troops. The velites, who used to skirmish before the army, were likewise called antesignani.

ANTESTARI, in Roman antiquity, signifies to bear witness against any one who refused to make his appearance in the Roman courts of judicature on the day appointed, and according to the tenor of his bail. The plaintiff finding the defendant, after such a breach of his engagement, was allowed to carry him into court by force, having first asked any of the persons present to bear witness. The person asked to bear witness in this case, expressed his consent by turning his right ear, which was instantly taken hold of by the plaintiff, and this was to answer the end of a subpœna. The ear was touched upon this occasion, says Pliny, as being the seat of memory, and therefore the ceremony was a sort of caution to the party to remember his engagement.

ANTESTATURE, in fortification, a small retrenchment made of palisadoes, or sacks of earth, with a view to dispute with an enemy the remainder of a piece of ground.

ANTEVERT. Lat. *anteverto*; from *ante*, before, and *verto*, to turn. To turn round before, so as to hinder or prevent. Obsolete.

Doubtless to prevent some enormous act, which may follow upon our silence, or upon the urging of careful authority, when we are called to give evidence concerning a fact questioned, or to *antevert* some great danger to the public, to ourselves, to our friends, we may, and must, disclose our knowledge of a close wickedness. *Bishop Hall's Cases of Conscience.*

ANTHALIUM, in ancient botany, the μαλιναθαλη of Theophrastus, a root growing in dry places, and about the bigness of the fruit of the medlar; it was dug up for food, and esteemed very wholesome.

ANTHELIA, in zoology, a genus of the class polypi, order tubiferi. Generic character: the common substance extended over marine bodies in a thin flattening mass, polypi not retractile, slightly prominent, erect, occupying the surface of the mass. Tentacula eight, pectinated. Savigny, who established this genus, describes but one species—A. glauca, native of the shores of the Red Sea.

ANTHELION; from αντι, and ηλιος, the sun; in physics, signifies a mock or spurious sun, a meteor, not very common, of a luminous appearance, somewhat resembling the sun, and seen through clouds, sometimes four or five times bigger than the solar disc. The most generally received opinion relative to the formation of this kind of meteor, attributes the phenomenon to a multitude of minute icy or snowy particles suspended in the air, and either refracting or reflecting the solar rays in such a manner as to multiply the image of the sun. See *Phil. Trans.* iii. p. 1.

ANTHELMIA, Indian pink.

ANTHELMINTICA, in medicine, vermifuges, or remedies against worms.

ANTHEM, Sax. antepn, written by Chaucer, *antem*; corresponding with the Gr. *αντιφωνια*, and the French *antienne*, alternate singing; a holy song.

Whilst thus I spake, behold! with happy eye
I spyde where at the idoles feet apart,
A bevie of fayre damzels close did lye,
Wayting when as the *antheme* should be sunger hye. *Spenser's Faerie Queene*, b. iv. c. 2.

Nor you, ye proud! impute to these the fault
If Memory o'er their tomb no trophies raise,
Where through the long-drawn aisle or fretted vault,
The pealing *anthem* swells the notes of praise.
Gray.

God Moses first, then David did inspire
To compose *anthems* for his heavenly quire. *Den.*

There is no passion that is not finely expressed in those parts of the inspired writings which are proper for divine songs and *anthems*. *Addison.*

ANTHEM; from αντι, and υμνος, a hymn; a church song performed in cathedral and other service by the choristers, divided for that purpose into choruses, who sing alternately. The word was originally used both for psalms and hymns, when thus performed.

ANTHEM, in modern church music, seems to answer to the antiphone singing of the primitive church. Ignatius is said to have introduced them into the Greek, and St. Ambrose into the western church. They now form a sort of third division of sacred music, differing equally from the metrical psalmody of our churches and chapels on the one hand, and the psalm or chanting of cathedrals on the other. They consist of a portion of scripture set in what is technically called 'florid counterpoin' and are either full verse, or solo anthems. The full anthem is a constant chorus, except at the leading off the fugue or a new point of imitation; verse-anthems have solos for different voices or sides of the choir,

solo-anthems sometimes have symphonies or ritornels for particular stops on the organ. The last are called motets in the Romish church. They were introduced into the reformed churches in queen Elizabeth's time

ANTHEMA, in antiquity, a Greek dance, accompanied with singing.

ANTHEME (St.) a small town of France, in Auvergne, the head of a canton, in the department of the Puy de Dome arrondissement of Ambert, sixteen leagues south-east of Clermont-Ferrand.

ANTHEMIS, in botany, camomile; a genus of the polygamia superflua order, and syngenesia class of plants, ranking in the natural method under the forty-ninth order, composita discoides. The essential characters are these: receptaculum chaffy; no pappus; the CAL. hemispheric and subequal; and the florets of the ray are more than five. Of this genus Linnæus enumerates seventeen species, of which the most remarkable: 1. A. Arabica has a branching empalement. The seeds of this species were brought from Africa by Dr. Shaw, and distributed to many curious botanists in this and other countries of Europe. 2. A. nobilis, or common camomile, grows in plenty upon commons and other waste land. 3. A. pyrethrum, or pellitory of Spain, a perennial plant, which grows naturally in Spain and Portugal, from whence the roots are brought to Britain. 4. A. tinctoria, with sawed-winged leave; a perennial plant, which flowers from June to November.

The nobilis and the pyrethrum are chiefly used in medicine. The first have a strong, not ungrateful aromatic smell, and a very bitter nauseous taste. They are accounted carminative, aperient, emollient, and in some measure anodyne, and stand recommended in flatulent colics; sometimes they have been employed in intermittent fevers and the nephritis. The flowers are also frequently used externally in discutient and antisceptic fomentations, and in emollient glysters. They enter the decoctum pro anemate and decoctum pro fomento of our pharmacopœias. An essential oil was formerly directed to be prepared from them, but it is now omitted. A simple watery infusion of them taken in a tepid state is frequently employed to promote the operation of emetics. The root of the pyrethrum is the only part endowed with medical virtue. It has no sensible smell; its taste is hot and acrid, but less so than that of arum or dracunculus: the juice expressed from it has scarce any acrimony, nor is the root itself so pungent when fresh as after it has been dried. Water assisted by heat extracts some share of its taste, rectified spirit the whole; neither of them elevate any thing in distillation. The principal use of the pyrethrum in the present practice, is as a masticatory for promoting the salival flux, and evacuating viscid humours from the head and neighbouring parts: by this means it often relieves the tooth-ach, pains of the head, and lethargic complaints.

ANTHEMIUS, emperor of the West, was the grand-son of Anthemius, minister of Theodosius the younger. By his marriage with the daughter of the emperor Marcian he rose to the highest offices, and in 467 was called to the throne amidst the general applause of the people. He gave his daughter to Ricimer, who took up arms against his father-in-law, carried Rome by storm, and murdered Anthemius, 472. Many medals or coins were struck of Anthemius the emperor, bearing the inscription D. N. ANTHEMIUS P. F. AUG. &c.; on the reverse, SALUS REIPUBLICÆ, &c.

ANTHEMIUS, a famous architect, whom Justinian employed in building the church of St. Sophia in Constantinople, and other structures. He was a good mathematician and experimental philosopher, and so successfully imitated an earthquake, that he frightened Zeno out of his house. It is said also that he made a burning glass.

ANTHERA, among botanists, that part of the stamen which is fixed on the top of the filamentum within the corolla: it contains the pollen or fine dust, which when mature it emits for the impregnation of the plant, according to Linnæus. The apex of Ray, Tournefort, and Rivinus; capsule staminis of Malpighi.

ANTHERA, in medicine, medicines so called from their florid red colour.

ANTHERICUM, in botany, spider-wort; a genus of the monogynia order and hexandria class of plants, and ranking in the natural method under the tenth order coronariæ. The characters are: no calyx: COR. six oblong petals, which are expanding: STAM. six subulated erect filaments; the antheræ small and furrowed: PIST. a three-cornered germen, a simple stylus, and obtuse stigma: PERICARP. an ovate trisulcated capsule, with three cells and three valves: the SEEDS numerous and angular. Of this genus Linnæus reckons nine species, but only the three following seem to deserve notice: 1. A. fructescens, with a shrubby stalk, formerly known among the gardeners near London by the name of onion-leaved aloe. 2. A. liliago; perennial plants, natives of Spain, Portugal, and other warm countries: they were formerly pretty common in the English gardens. 3. A. ramosum, with a branching stalk.

ANTHERINUS, in entomology, a species of cryptocephalus, in Gmelin's arrangement. The tenebrio pedicularis of the tenth edition of the Linnæan Systema Naturæ, and meloe antherinus of the twelfth, and the Fauna Suecica. Fabricius places it in his genus lagria, in the species insectorum: it is very small and lives on flowers.

ANTHERMUS, in ancient history, a Chian sculptor, son of Micciades and grandson to Malas. He and his brother Bupalus made a statue of the poet Hipponax which caused universal laughter, on account of the deformity of its countenance. The poet, being incensed upon this satirised the statuaries with so much bitterness that they hung themselves.—*Pliny.*

ANTHESIS, in botany; *ανθησις*, efflorescentia, efflorescence; that state of vegetation in which the flower is completely developed.

ANTHESPHORIA, in antiquity; from *ανθος* flower, and *φερω*, I carry; a Sicilian festival instituted in honour of Proserpine, that goddess being taken off by Pluto when she was gathering flowers. Festus does not ascribe the feast to Proserpine, but says it was thus called by reason of ears of corn carried on this day to the temples. It seems to be the same with the floriser

tum of the Latins, and answers to the harvest-home among us.

ANTHESTERIA, in antiquity, was a feast celebrated by the Athenians in honour of Bacchus. It lasted three days, the eleventh, twelfth, and thirteenth of the month, each of which had a name suited to the proper office of the day. The first day was called πιθοιγια, i. e. opening of the vessels; because on this day they tapped the vessels and tasted the wine. The second χοαι, choæ, the name of a measure containing the weight of ten pounds; on this day they drank the wine prepared the day before. The third χυτροι, kettles; on this day they boiled all sorts of pulse; which, however, they were not allowed to taste, as being offered to Mercury.

ANTHESTERION, in ancient chronology, the sixth month of the Athenian year. It contained twenty-nine days, and answered to the latter part of our November and beginning of December. The Macedonians call it dæsion, or desion. It had its name from the festival antheteria kept in it.

ANTHIA, in zoology, a name by which some improperly call the falx venetorum, or sickle-fish, a long anguilliform fish of the tænia kind.

ANTHIAS, in zoology, the name of a fish approaching the turdus or wrasse kind, of which Rondeletius and some other authors have described four species. Linnæus makes it a species of the labrus.

ANTHINE, or ANTHINOS, among ancient naturalists, is an appellation given to certain species of wine and oil; vinum anthinos, οινος ανθινος, was that prepared with certain fragrant flowers to give it the more agreeable odour.

ANTHISTIRIA, in botany: a genus of the monogynia order, and triandria class of plants; ranking, in the natural method, under the fourth order, gramina. The characters are: CAL. a two-valved glume equally cleft to the base: COR. two-valved glume: STAM. three short slender filaments: the anthera oblong and erect: PIST. an oblong germen; the styli two; and the stigmata clavated and hairy: no pericarpium, except closed calyx; SEED is oblong and furrowed. There is only one species of this grass, the ciliata or fringed anthistiria, a native of India.

ANTHOCEROS, or HORN-FLOWER, in botany, a genus of the order of algæ, and cryptogamia class of plants; ranking in the natural method under the fifty-seventh order, algæ. The essential characters are: CAL. of the male sessile, cylindric and entire; the anthera (one) is subulate, very long, and two-valved: CAL. of the female, monophyllous, divided into six parts, expanding: SEEDS about three, naked and globular. There are three species, viz. 1. A. laevis, a native of Europe and America. 2. A. fissidus, a native of Germany, found in moist shady places, and on heaths. 3. A. punctatus, spotted anthoceros, a native of Britain.

ANTHODIUM, in botany, the calyx common of Linnæus, and the common perianth or involucrum, which contains a great number of flowers that appear but as one, as in leontodon taraxacum, blue-bottle; centaurea cyanus, sun-flower,

ANTHOLOGION, in ecclesiastical affairs, a service-book used in the Greek church, and containing the offices sung throughout the year, on the festivals of our Saviour, the Virgin, &c.

ANTHOL'OGY, ANTHOLOG'ICAL. Gr. ανθολογια; from ανθος, a flower, and λεγω, to gather; a collection of beautiful specimens of poetry. Also a book of devotions in the Greek church.

There is in the Greek *anthology* a remarkable mention hereof [sneezing] in an epigram upon one Proclus. *Brown's Vulgar Errors.*

He [Robert Stafford] published a geographical and *anthological* description of all empires and kingdoms, both of continent and islands in this terrestrial globe, &c. *Wood's Athen. Oxon.*

ANTHOLYZA, in botany, mad-flower: a genus of the monogynia order, and triandria class of plants; ranking in the natural method under the sixth order, ensatæ. The essential characters are these: CAL. tubular, irregular, and bent back; and the capsule is beneath the flower. 1. A. ringens, whose flower-slips spread asunder. 2. A. spicata, with narrow-furrowed leaves, in shape and size like the vernal crocus, but the outer skin thin and white.

ANTHOMYIA, in zoology, a genus of insects of the order diptera, and family muscides of Latreille. The antennæ are shorter than the head; head hemispherical, transverse; vertex inclined, body not much elongated. A. Pluvialis, a British insect of this genus, is often seen in crowds dancing in the air, especially a short time before rain. It inhabits woods.

ANTHONY, ST. is said to have been born in Egypt in 251, and to have inherited a large fortune, which he distributed among the poor. After this he retired into solitude, founded a religious order, built many monasteries, and died anno 356. Many ridiculous stories are told of his conflicts with the devil, and of his miracles; and seven extant epistles are attributed to him. He is sometimes represented with a fire by his side, signifying that he relieves persons from the inflammation called after his name; but always accompanied by a boar, on account of his having been a swine-herd, and curing all disorders in that animal. His pictures on the walls of houses have been supposed to preserve from the plague; and the Italians, who do not know the true signification of the fire painted at his side, conclude that he preserves houses from being burnt. Both painters and poets have made very free with this saint and his followers: the former by many ludicrous pictures of his temptation; and the latter by a few epigrams on his disciples.

ANTHONY (Francis), a famous empiric, born in London in 1550, and educated at Cambridge, where he studied chemistry. He made a great fortune by the sale of a nostrum, called the aurum potabile, concerning which he wrote a treatise, printed at Hamburgh in 1598. He was twice imprisoned and fined for imposture. His son John succeeded him in the sale of his medicine, from which he received a handsome income. He wrote Lucas Redivivus, or the Gospel Physician, 1656, 4to. and died in 1665.

ANTHONY, ST. a cape on the coast of the province of Buenos Ayres. It forms the south point of entrance into the Plata. There are

three other capes of the same name, one of which forms the western extremity of the island of Cuba. Long. 84° 56′ W., lat. 21° 54′ N.—Another on the coast of Todos Santos in Brasil. Long. 38° 37′ W., lat 13° S.—Another on the coast of the straits of Magellan, between the bay of Arenas and the bay of Santa Catalina.

ANTHONY, ST., FALLS OF, in the Mississippi, North America, about 2000 miles from its mouth, and in lat. 44° 50′ N., were first seen and named by Hennepin, a French missionary in 1680. The river is 627 yards broad above the fall, and immediately below it is contracted within a channel of 209 yards. The perpendicular height of the fall is 16½ feet, besides 58 feet more of a rapid below, so that when viewed from a distance it appears to be much higher than it really is. In the middle of the stream above stands a small island, on which grow a few hemlock and spruce trees, and about half way between this island and the eastern shore is a rock, lying at the very edge of the fall, in an oblique position, about five or six feet broad, and thirty or forty long. The surrounding country is extremely beautiful. At a little distance below the fall is a small island, about 1½ acre, covered with oak trees, on the branches of which are numerous eagles' nests, secure on account of the rapids above from the attacks either of man or beast. When the Mississippi is full the appearance of these falls is very sublime.

ANTHONY'S, ST. ISLAND, the most northern of the Cape Verd Islands. Topazes are found, in one of its mountains, and it is said to contain mines of gold and silver. The inhabitants, chiefly negroes, are about 580 in number.

ANTHONY, ST. (Knights of), a military order, instituted by Albert, duke of Bavaria, Holland, and Zealand, when he designed to make war against the Turks in 1382. They wore a collar of gold made in form of a hermit's girdle, from which hung a stick like a crutch, with a little bell, as they are represented in St. Anthony's pictures.

ANTHONY gives the denomination to a religious order founded in France about the year 1095, for the cure of those afflicted with St. Anthony's fire. These monks, it is said, assumed to themselves the power of giving, as well as removing, the ignis sacer, or erysipelas.

ANTHONY'S FIRE, in medicine, a kind of erysipelas, which is named after St. Anthony of Padua. It is known, that anciently diseases had their peculiar saints: thus, in the ophthalmia, persons had recourse to St. Lucia; in the toothach to St. Apollonia; in the hydrophobia to St. Hubert, &c.

ANTHOPHORA, in botany, a genus of insects of the order hymenoptera, and family apiariæ. Generic character: mandibles unidentate within; maxillary palpi, with six articulations.

ANTHOPHORA RETUSA, the apis retusa of Linnæus and Kirby, is a British insect, and builds its nest in hard banks of clay or gravel, and even, according to Ray, in stone walls. It contains several oval cells, lined with a thin white membrane, each about three quarters of an inch long, and less than half an inch in diameter.

ANTHOPHYLLI, or ANTOPHALI, in botany, a denomination sometimes given to the larger species of cloves.

ANTHOPHYLLITE is a massive mineral of a brownish colour; sometimes also crystallised, in thin flat six-sided prisms, streaked lengthwise. It has a false metallic lustre, glistening and pearly. In crystals, transparent. Massive, only translucent on the edges. It does not scratch glass, but fluate of lime. Specific gravity 3·2. Somewhat hard, but exceedingly brittle. Infusible alone before the blowpipe, but with borax it gives a grass-green transparent bead. It consists of 56 silica, 13·3 alumina, 14 magnesia, 3·33 lime, 6 oxide of iron, 3 oxide of manganese, 1·43 water, and 2·94 loss in 100: found at Konigsberg in Norway.

ANTHORA, in botany, the trivial name of a species of aconitum. See ACONITUM.

ANTHORISMUS, in rhetoric, a contrary description or definition of a thing from that given by the adverse party.

ANTHOS; ἄνθος, Gr. a flower; by way of excellency appropriated to rosemary.

ANTHOS, in chemistry, the quintessence or elixir of gold, or a medicine extracted from pearls.

ANTHOS PHILOSOPHORUM, a method of transmuting metals by means of vitriol.

ANTHOSMIAS, among ancient naturalists, a rich odoriferous kind of wine. It differs from anthinos, as the latter imports a medicated wine scented with odoriferous herbs, whereas anthosmias derived its fragrancy from the native grapes.

ANTHOSPERMUM, in botany, the amber tree; a genus of the dicœcia order, and polygamia class of plants, ranking in the natural method under the forty-seventh order, stellatæ.—The essential characters are: CAL. a hermaphrodite flower is divided into four parts; no corolla; STAM. are four, and the pistilli two; the germs beneath the flower. Male and female on the same or separate plants. Of this genus Linnæus mentions three species, viz. 1. A. æthiopica. A. ciliare. 3. A. herbacea. The fruit is not generally known in the gardens of the curious. Its beauty consists in its small evergreen leaves which grow as close as heath.

ANTHOXANTHUM, in botany, vernal-grass, a genus of the digynia order, and diandria class of plants; ranking in the natural method under the fourth order, gramina. The essential characters are: CAL. a bivalved gluma, with one flower; the corolla bivalved, obtuse, and without any awn. There are three species, viz. 1. A. Indicum, a native of India. 2. A. odoratum, or spring-grass, a native of Britain; one of the earliest spring grasses. 3. A. Paniculatum, a native of the southern parts of Europe.

ANTHRACITE, in mineralogy, blind coal, Kilkenny coal, or glance coal. There are three varieties: 1. Massive, the conchoidal of James: its colour is iron-black, sometimes tarnished on the surface with a splendent metallic lustre. Fracture conchoidal, with a pseudo-metallic lustre. It is brittle and light. It yields no flame, but leaves whitish ashes. It is found in the trap-floetz formations, at Meissner in Hesse, and Walsall in Staffordshire. 2. Slaty anthracite. Colour black, or brownish-black. Lustre

slaty in one direction, with a slight metallic lustre. Brittle. Specific gravity 1·4 to 1·8. Consumes without flame. It is composed of 72 carbon, 13 silica, 3·3 alumina, and 3·5 oxide of iron. It is found in both primitive and secondary rocks; at Calton Hill, Edinburgh; near Walsall, Staffordshire; in the southern parts of Brecknockshire, Caermarthenshire, and Pembrokeshire, whence it is called Welsh culm; near Cumnock and Kilmarnock, Ayrshire; and most abundantly at Kilkenny, Ireland. 3. Columnar anthracite. In small short prismatic concretions of an iron-black colour, with a tarnished metallic lustre. It is brittle, soft, and light. It yields no flame or smoke. It forms a thick bed near Sanquhar, in Dumfrieshire; at Saltcoats and New Cumnock, in Ayrshire, and occurs also at Meissner in Hesse.

ANTHRACOSIS, in medicine, a corrosive scaly ulcer, either in the bulb of the eye or the eye-lids.

ANTHRAX, in medicine, is the same with what is otherwise denominated carbo and carbunculus. Some limit the latter to the glandular parts, and the former to all the others. But the distinction is scarcely worth making.—The word is sometimes also used for lithanthrax or pit-coal. See LITHANTHRAX.

ANTHRENUS, in entomology, a genus of the class insecta, order coleoptera. Generic character: antennæ clavate; feelers unequal; jaws membranaceous; lip entire; head hid under the thorax. The principal species are: A. denticornis, which inhabits Santa Cruz. A. Histrio, found in Germany, &c.

ANTHRIBOS, in entomology, a division of the genus curculio, comprehending those species which have the lip bifid, jaw bifid, and snout short.

ANTHROPODÆMON, in ancient writers, a demon supposed to be concealed under the figure or appearance of a man.

ANTHROPOGLOTTUS, among zoologists, an appellation given to such animals as have tongues resembling those of mankind, particularly to the parrot kind.

ANTHROPOGRAPHY denotes the description of the human body, its parts, structure, &c. See ANATOMY.

ANTHROPOLATRÆ, in church history, an appellation given to the Nestorians, on account of their worshipping Christ, notwithstanding that they believed him to be a mere man.

ANTHROPOLITES, in natural history, a term denoting petrifactions of the human body, as those of quadrupeds are called zoolites. It has been doubted whether any real human petrifications ever occur, and whether those which have been supposed such were not mere lusus naturæ. But the generality of naturalists best versed in this branch assure us of real anthropolites being sometimes found. And indeed, as it is universally admitted that the zoolites are frequently seen, what negative argument can be brought against the existence of the others? The component parts of the human body are nearly similar to those of the brute creation, and correspondent matter may therefore be subject to, and acquire, the like accidental changes, wherever the same power or causes concur to act. If the former are not so common, it may be accounted for, in some measure, by reflecting that human bodies are generally deposited in select and appropriated places; whereas the bones of animals are dispersed everywhere, and falling into various parts of earth, at greater or less depth, there is more probability of their encountering the petrifying agent. Some authors tell us of entire bodies and skeletons that were found petrified. One in particular, discovered at Aix en Provence anno 1583, in a rocky cliff, the cerebrum whereof, when struck against a piece of steel, produced sparks, the bones being at the same time friable. But the reports of Happel and Kircher are too absurd for relief. Van Helmont's strange relations, together with those of Jean a Costa, must also be rejected as fabulous. Scheuhzer has published an engraved figure, which he calls the Antediluvian man. But it is a known fact, that detached parts, osteolithi, are sometimes found especially in situations where either the water, the soil, or both, have been observed to possess a strong putrescent quality. The vertebræ, fragments portions of the tibia, and even the whole cranium itself, have been seen in an absolute state of petrification. Some of these are said to appear vitriolated or mineralised. The petrified bones of pretended giants are more properly real zoolites, or the bones of the larger animals. See PETRIFACTION.

ANTHROPOL'OGY; *ανθρωπος*, a man, and *λογος*, a discourse; a treatise on human nature. It is sometimes equivalent to the expression in theology 'speaking after the manner of men.'

ANTHROPOMANCY; from *ανθρωπος*, a man, and *μαντεια*, divination; a species of divination performed by inspecting the entrails of a human creature.

ANTHROPOMETRIA, a description of the human body, with its several parts and members.

ANTHROPOMETRICA MACHINA, a name which Sanctorius gave to his weighing chair, contrived for measuring the quantity of insensible perspiration.

ANTHROPOMORPHA, a term formerly given to that class of animals which have the greatest resemblance to the human kind.

ANTHROPOMOR'PHITE, } *Ανθρωπος*, a
ANTHROPOMOR PHITISM, } man, and *μορφη*, a form. One who ascribes a human figure and bodily form to God.

> The doctrine of the *anthropomorphites*, and the euchitæ, proceeded from the literal sense of some texts of Scripture. *Taylor's Polem. Discourses.*
>
> Christians as well as Turks, have had whole sects contending that the Deity was corporeal and of human shape; though few profess themselves *anthropomorphites*, yet we may find many amongst the ignorant of that opinion. *Locke.*
>
> But because I know you are not swayed by names and authorities, I shall endeavour to show you a little more distinctly, the inconveniences of that *anthropomorphitism*, which you have embraced.
> *Hume's Dial. concerning Nat. Religion.*

ANTHROPOMORPHITES, in church history, a sect of ancient heretics, who taking every thing spoken of God in scripture in a literal sense, particularly that passage of Genesis in which

it is said 'God made man after his own image,' maintained that God had a human shape. They are likewise called Audeni, from Audens their leader.

ANTHROPOMORPHOUS, something that bears the figure or resemblance of a man. Naturalists give instances of anthropomorphous plants, anthropomorphous minerals, &c. These generally come under the class of what they call lusus naturæ, or monsters. Anthropomorphous stones make a species of figured stones. The word is applied to the mandrake.

ANTHROPOPATHY, in theology, a figure, expression, or discourse, whereby some passion is attributed to God, which properly belongs only to man; a signification similar to anthropology.

ANTHROPOPHAGI. Ανθρωπος, a man, and φαγω, to eat: man-eater.

Upon slender foundations was raised the *anthropophagy* of Diomede's horses. *Brown's Vulgar Errors.*

Go, knock, and call; he'll speak, like an *anthropophaginian*, unto thee; knock, I say. *Shaksp.*

The cannibals that each other eat,
The *anthropophagi*, and men whose heads
Do grow beneath their shoulders. *Shaksp. Othello*

ANTHROPOPHAGI. That there have been in almost all ages of the world, nations who have followed this barbarous practice, we have abundant testimony. The Cyclops, the Lestrygons, and Scylla, are all represented in Homer as anthropophagi, or man-eaters; and the female phantoms, Circe and the Cyrens, first bewitched with a show of pleasure, and then destroyed. This, like the other parts of Homer's poetry, had a foundation in the manners of the times preceding his own. According to Herodotus, among the Essedonian Scythians, when a man's father died, the neighbours brought several beasts, which they killed, mixed up their flesh with that of the deceased, and made a feast. Among the Massagetæ, when any person grew old they killed him and eat his flesh; but if he died of sickness they buried him, esteeming him unhappy. The same author also assures us, that several nations in the Indies killed all their old people and their sick to feed on their flesh; he adds, that persons in health were sometimes accused of being sick to afford a pretence for devouring them. According to Sextus Empiricus the first laws that were made were for the prevention of this barbarous practice, which the Greek writers represent as universal before the time of Orpheus. The philosophers Diogenes, Chrysippus, and Zeno, followed by the whole sect of Stoics, affirmed that there was nothing unnatural in the eating of human flesh; and that it was very reasonable to use dead bodies for food, rather than to give them a prey to worms and putrefaction. In order to make the trial, however, whether there was any real repugnancy in nature to the feeding of an animal with the flesh of its own species, Leonardus Floroventius fed a hog with hog's flesh, and a dog with dog's flesh; upon which he found the bristles of the hog to fall off, and the dog to become full of ulcers.

Of the practice of anthropophagy in later times, we have the testimonies of all the Romish missionaries who have visited the internal parts of Africa, and even some parts of Asia. Herrera speaks of great markets in China furnished wholly with human flesh. Marcus Paulus speaks of similar practices in the kingdom of Gonchi towards Quinsay, and the island of Zapengit; others of the inhabitants of Java, of the kingdom of Siam, of the island of Sumatra, and of the islands in the Gulf of Bengal, being anthropophagites. When America was discovered this practice is said to have been found almost universal there, insomuch that several authors have supposed it to be occasioned through a want of other food, or through the indolence of the people to seek for it; though others ascribe its origin to a spirit of revenge: and much is to be subtracted from all these accounts in allowance for the propensity of the early conquerors and missionaries to make the worst of the picture. It appears pretty certain, however from Dr. Hawkesworth's Account of the Voyages to the South Seas, that the inhabitants of New Zealand, a land not unfurnished with the necessaries of life, eat the bodies of their enemies. Mr. Marsden also informs us that this horrible custom is practised by the Battas, a people of Sumatra. 'They do not eat human flesh,' says he, 'as a means of satisfying the cravings of nature, owing to a deficiency of other food; nor is it sought after as a gluttonous delicacy as it would seem among the New Zealanders. The Battas eat it as a species of ceremony as a mode of showing their detestation of crime by an ignominious punishment; and as a horrid indication of revenge and insult to their unfortunate enemies. The objects of this barbarous repast are the prisoners taken in war, and offenders convicted and condemned for capital crimes. Persons of the former description may be ransomed or exchanged, for which they often wait a considerable time; and the latter suffer only when their friends cannot redeem them by the customary fine of twenty beesangs, or eighty dollars. These are tried by the people of the tribe where the fact was committed, but cannot be executed till their own particular raja or chief has been acquainted with the sentence; who, when he acknowledges the justice of the intended punishment, sends a cloth to cover the delinquent's head, together with a large dish of salt and lemons. The unhappy object, whether prisoner of war or malefactor, is then tied to a stake: the people assembled throw their lances at him from a certain distance; and when mortally wounded, they run upon him, and if in a transport of passion, cut pieces from the body with their knives, dip them in the dust, salt and lemon-juice, slightly broil them over a fire prepared for the purpose, and swallow the morsels with a degree of savage enthusiasm. Sometimes, according to the degree of their animosity and resentment, the whole is devoured; and instances have been known, where, with a barbarity still more aggravated, they tear the flesh from the carcase with their mouths. To such a depth of depravity may man be plunged, when neither religion nor philosophy enlightens his steps! All that can be said in extenuation of the horrid this diabolical ceremony is, that no view appears to be entertained of torturing the sufferers

ncreasing or lengthening out the pangs of death; the whole fury is directed against the corse, warm indeed with the remains of life, but past the sensation of pain. I have found a difference of opinion in regard to their eating the bones of their enemies slain in battle. Some persons long resident there, and acquainted with their proceedings, assert that it is not customary; but as one or two particular instances have been given by other people, it is just to conclude that it sometimes takes place, though not generally. It was supposed to be with this intent that raja Neabin maintained a long conflict for the body of Mr. Nairne, a most respectable gentleman and valuable servant of the India Company, who fell in an attack upon the campong of that chief, in the year 1775. The annals of Milan furnish an extraordinary instance of anthropophagy. A Milanese woman, named Elizabeth, from a depraved appetite, had an invincible inclination to human flesh, of which she made provision by enticing children into her house, where she killed and salted them; a discovery of which having been made, she was broken on the wheel and burnt in 1519.

ANTHROPOSCOPIA; from *ανθρωπος*, and *σκοπεω*, I consider; the art of judging or discovering a man's character, disposition, passions, and inclinations, from the lineaments of his body. In which sense, anthroposcopia seems of somewhat greaterextent than physiognomy, or metoposcopy. Otto has published an Anthroposcopia, sive judicium hominis de homine ex lineamentis externis.

ANTHROPOTHYSIA, the inhuman practice of offering human sacrifices. See SACRIFICE.

ANTHUMON, in the ancient materia medica, a name given to the epithymum, or dodder, growing upon thyme.

ANTHUS, in ornithology, a synonyme of a species of loxia. See LOXIA.

ANTHUS, in zoology, a name by which Aldrovand and some other authors have called that species of the œnanthe known in England by the name of the whin-chatt.

ANTHYLLIS, in botany, kidney-vetch, or lady's finger: a genus of the decandria order, and diadelphia class of plants; ranking in the natural method under the thirty-second order, papilionaceæ. The essential characters are: CAL. cuticose, and the legumen is roundish and covered. Linnæus enumerates nine species; of which the following seem to be most worthy of attention. 1. A. barba jovis, or silver-bush, which has its name from the whiteness of its leaves. 2. A. cytisoides, or shrubby woundwort, has long been known in the English gardens. 3. A. montana, or herbaceous woundwort, with winged leaves, grows naturally in the mountains in the south of France, and in Italy. A. vulneraria, with unequal winged leaves, is native of Spain and Portugal, as also of Wales.

ANTHYPOMOSIA, in ancient writers, an oath taken by a prosecutor or accuser, declaring that the absence of the party accused is not for any just cause, and therefore demanding that judgment may no longer be delayed on that account.

ANTHYPOPHORA, in rhetoric, stands opposed to hypophora, e. g. If the hypophora be, grammar is indeed a little difficult to obtain; the anthypophora would be; grammar is indeed a little difficult to attain, but then its use is infinite. See HYPOPHORA.

ANTI. *Αντι*, against; a prefix to many words which are derived from the Latin and Greek, they however, always maintain the significations which belongs to them out of composition, as Antichrist, Antitrinitarian.

> My little sones, the last our is, and as he has herde that *antichrist* cometh, now many *anticristes* ben maad, wherefore we witen, that is the last our.
> *Wielif.* 1. *Jon.* ch. 2. p. 140.

> If once that *antichristian* crew,
> Be crush'd and overthrown,
> We'll teach the nobles how to crowch,
> And keep the gentry down.
> *Francis Qnarles in Ellis*, v. 3. p. 123.

> When the *antichristian* powers attack religious establishments by the sword they may and must be defended. *Horsley's Sermons.*

ANTIA LEX, in antiquity, a law made for the suppression of luxury at Rome. Its particulars are not known. The enactor was Antius Restio, who never afterwards supped abroad for fear of being himself a witness of the profusion and extravagance which his law meant to destroy, but without effect.

ANTIADES, in anatomy, the glandules, or kernels, more commonly called tonsils, and almonds of the ears.

ANTIADIAPHORISTS, opposite to the Adiaphorists; from *αντι*, and *αδιαφορος*, indifferent; an appellation given in the sixteenth century to the rigid Lutherans, who disavowed the episcopal jurisdiction, and many of the church ceremonies retained by the moderate Lutherans.

ANTIBACCHIUS, in ancient poetry, a foot consisting of three syllables, the two first long, and the last one short; such as the word vīrtūtĕ.

ANTIBALLOMENA, medicines which may be substituted for each other.

ANTIBARBARA, and ANTIBARBARUM, titles given to several works levelled against the use of barbarous terms and phrases, chiefly in the Latin tongue. Erasmus, Nizolius, and Cellarius, have published Antibarbara; Noltenius a Lexicon Antibarbarum, consisting of observations made by the grammarians of latter ages in relation to the purity and corruption of Latin words. Sixtus Amama has given an Antibarbarus Biblicus, wherein he pretends to have discovered seven sources of the barbarisms which have got footing of late ages in the Bible. Peter du Moulin used the title antibarbarous for a book against the use of an unknown tongue in divine service.

ANTIBARI, a town of European Turkey, situated upon a hill, on the coast of the Adriatic Sea. It has a harbour at the foot of the hill, but is thinly peopled.

ANTIBES, an old town of Provence in the department of the Var, on the Mediterranean, with a commodious harbour and a strong citadel, six miles from Nice. It was founded by a co-

lony of Marseillese, 340 years B. C. and named Antipolis. It suffered severely from the Saracens, and now contains about 500 houses, with 5270 inhabitants, who are chiefly employed in the sardel fishery, and in the manufactory of earthenware. It is an important barrier fortress on the side of Italy, and was besieged without effect by the Austrians and English in 1747. The harbour is about 1012½ feet long, 270 broad, and 4050 in circumference. The trade of the place is of little consequence, but it contains a number of Roman antiquities, and is the chief town of a canton. Antibes is remarkable for being the only place where the French soldiers refused to join Buonaparte on his landing from Elba in 1815. Lon. 7° 11 E., lat. 43° 35′ N.

ANTIBIBLOS, in civil law, an instrument or signature whereby the defendant owns he has received the libel, or a copy of it, and notes the day whereon he received it. This is usually done on the back of the libel.

ANTIBURGHER SECEDERS, a numerous and respectable body of dissenters from the church of Scotland, who differ from the established church chiefly in matters of church government, and who differed from Burgher Seceders, with whom they were originally united, chiefly if not solely respecting the lawfulness of taking the burgess oath. For an account of their origin and principles, see SECEDERS.

ANTICADMIA, a species of mineral cadmia, sometimes also called pseudo-cadmia. It takes this denomination, not as being opposite in quality to the cadmia, but because it is used as a substitute for it.

ANTICARDIUM, in anatomy; from *αντι*, and *καρδια*, the heart; that hollow part under the breast, just against the heart, commonly called the pit of the stomach: called also scrobiculus cordis.

ANTICATARRHAL, an epithet given to medicines prescribed for catarrhs.

ANTICATEGORIA, in oratory, denotes a recrimination or mutual accusation; where the two parties charge each other with the same crime. Apollodorus considers the anticategoria as two several causes or actions.

ANTICAUSOTICS, among physicians, medicines against hot fevers.

ANTICHEIR, in anatomy; *αντιχειρ*; the Greek name for the pollex, or thumb.

ANTICOLICA; from *αντι* and *χολικος*; medicines against the colic.

ANTICHORUS, in botany; a genus of the monogynia order, and octandria class of plants, of which the essential characters are: CAL. a four-leaved perianthium: COR. four expanding petals: PERICARP. a capsule, above, subulated, with four cells, and four valves: the seeds very numerous. There is but one species—A. pressus, native of Arabia.

ANTICHRESIS, in the civil law, a covenant convention, whereby a person borrowing money of another, engages or makes over his lands or goods to the creditor, with the use and occupation thereof, for the interest of the money lent; it was allowed by the Romans, among whom usury was prohibited: and was afterwards called mortgage, to distinguish it from a simple engagement, where the fruits of the ground were not alienated.

ANTICHRIST, among ecclesiastical writers, denotes a great adversary of Christianity, who is to appear upon the earth towards the end of the world. There have been demonstrations, disputations, and proofs, in great number, both that the pope is, and that he is not antichrist. F. Calmet is very full in describing the father and mother of antichrist, his tribe and pedigree, his wars and conquests, his achievements against Gog, Magog, &c. Some place his capital at Constantinople, others at Jerusalem, others at Moscow, and some at London; but the generality at Rome, though these last are divided. Grotius and some others suppose Rome pagan to have been the seat of antichrist, and Caligula or Nero the person: most of the Lutheran and reformed doctors contend earnestly for Rome Christian, under the papal hierarchy. In fact, the point having been maturely debated at the council of Gap held in 1603, a resolution was taken thereupon to insert an article in the confession of faith, whereby the pope is formally declared to be antichrist.—Pope Clement VIII. was stung to the quick with this decision; and even king Henry IV. of France was not a little mortified to be thus declared, as he said, an imp of antichrist. M. le Clerc holds, that the rebel Jews and their leader Simon, whose history is given by Josephus, are to be reputed as the true antichrist. Lightfoot and Vanderhart rather apply this character to the Jewish sanhedrim. Hippolitus and others held, that the devil himself was the true antichrist; that he was to be incarnate, and make his appearance in human shape before the consummation of all things.—Father Malvenda, a Jesuit, published a large work entitled Antichristo, in which he relates all the opinions of the fathers with regard to antichrist; and finally contends that he is to be a Jew, of the tribe of Dan. Hannius and some others have written upon the unity of antichrist, and assert that there is to be both a eastern and a western antichrist. How endless are conjectures! Some of the Jews, we are told, actually took Cromwell for the Christ; while some others have laboured to prove him antichrist himself! Psaffius assures us, he saw a folio book in the Bodleian library, written on purpose to demonstrate this latter position. Modern writers have added to the conjectures respecting antichrist: Mr. Faber finds one in revolutionary France; and some obscurer interpreters have awarded that honour, we believe, to Buonaparte personally. Upon the whole, the antichrist mentioned by the apostle John, 1 Epist. ii. 18. and more particularly described in the book of Revelations, seems evidently to be the same with the Man of Sin, &c. characterised by St. Paul in his second epistle to the Thessalonians, chap. ii. And the entire description literally applies to the excesses of papal power. Had the right of private judgment, says an excellent writer, been always adopted and maintained, antichrist could never have been; and when the sacred right comes to be universally asserted, and men follow the voice of their own reason and consciences, antichrist can be no more

ANTICHTHON; from *αντι*, and *χθων*, earth; in ancient astronomy, a globe of earth resembling ours, and supposed to be moving round the sun, but invisible to us, because on the opposite side; that luminary being always exactly interposed between this other earth and ours. This idea was asserted by Pythagoras and his disciples, as is testified by Aristotle, Plutarch, &c. They reasoned from the supposed perfection of the number ten, and concluded there must be just so many spheres; and as our senses only discover nine, viz. the seven planets, the sphere of the fixed stars, and our earth, they imagined a tenth opposite to ours. Some of the fathers, who endeavoured to accommodate the doctrine of the heathen philosophers to those of Christianity, assert that this Pythagorean earth is no other than the heavens of the righteous.

ANTICTHONES, or ANTIGENÆ, in geography, those who inhabit countries diametrically opposite to each other. In which sense it is synonymous with what we more usually call antipodes.

ANTI'CIPATE, ANTICIPA'TION, ANTI'CIPATORY. Anticipo, from *ante*, before, and *capio*, to take. To possess or to take mentally before the act has been performed, or the event has happened in the order of time: to have beforehand, to forestal, to prevent.

This payment was called an *anticipation*, which is to say a thing taken, or a thing cõmyng before his tyme or season. This terme was new to ye cominaltie, but thei payd wel for their learnying, for their money was paied out of hand w^tout delay.
Hall. Henry VIII.

Time, thou *anticipat'st* my dread exploits;
The flighty purpose never is o'ertook,
Unless the deed go with it. *Shakspeare.*

God hath taken care to *anticipate* and prevent every man, to draw him early into his church; to give piety the pre-possession, and so to engage him in holiness. *Hammond.*

If our apostle had maintained such an *anticipating* principle, engraven upon our souls before all exercise of reason; why did he talk of seeking the Lord, seeing that the knowledge of him was innate and perpetual? *Bentley.*

Why should we
Anticipate our sorrows? 'tis like those,
That die for fear of death. *Denham.*

ANTICIPATION; from ante, before, and capio, I take; in logic, a presumption, prejudice, or preconceived opinion.

ANTICIPATION, in medicine, is applied to diseases, wherein some of those symptoms which regularly belong to some future period, appear in the beginning.

ANTICIPATION, in philosophy, denotes the first idea of a thing, without which we can neither name, think, doubt, or even enquire concerning it. It is also denominated prenotion, and in this sense makes the second of Epicurus's criterions of truth.

ANTICIPATION, in rhetoric, a figure otherwise called prolepsis.

ANTICIPATION, in music. A sound is said to be anticipated, when a composer wishes a note to be heard before its time, in plain counterpoint. Anticipation, in the treble, requires suspension in the base, and è contra. There are several kinds of anticipation in music: first, in passing notes, of which no notice is taken in the base; but this must be done diatonically, not by distant intervals or leaps. Secondly, when the chord is struck on a rest, before the base. Thirdly, in serious and fundamental discords that are to be regularly prepared and resolved, the anticipation in the treble is striking the second before it becomes a third, by the descent of the base. And anticipation in the base, or inferior parts, is when the base rises before the treble falls; as from the eighth to the seventh, or tenth, (octave of the third,) to the ninth.

ANTICK, *v. n.* & *adj.* AN'TICKLY, AN'TICKNESS. Supposed to be derived from the Latin *antiquus*, ancient; and therefore exhibiting habits and forms differing from the actual mode; old fashions, grotesque, uncouth; like a buffoon, odd, singular.

At the entrying into the palace before the gate, on the plaine greene, was buylded a fountaine of embowed worke, gulte with fyne golde, and bice ingrayled wyth *anticke* workes, the olde god of wyne called Baccus birlying the wyne, which by the conduytes in the earth ranne to alle people plentiously with red, white, and claret wines. *Grafton*, v. 2. p. 303.

HIP. 'Tis strange, my Theseus, what these lovers speak of.

THES. More strange than true. I never may believe
These *antick* fables, or these Fairy toys;
Lovers and madmen have such seething brains,
Such shaping fantasies, that apprehend more
Than cooler reason ever comprehends;
The lunatick, the lover, and the poet,
Are of imagination all compact.
Shakspeare. Midsummer Night's Dream.

K. RICH. For within the hollow crown
That rounds the mortal temples of a king,
Keeps death his court; and there the *antick* sits,
Scoffing his state and grinning at his pomp.
Shakspeare. K. Rich. II.

But let my due feet never fail
To walk the studious cloyster's pale,
And love the high embowed roof,
With *antic* pillars massy proof,
And storied windows richly dight,
Casting a dim religious light. *Milton.*

ANTIC, in sculpture and painting, a fantastical composure of figures of different natures, sexes, &c. as men, beasts, birds, flowers, fishes, and things merely imaginary. It amounts to much the same thing with what the Italians call grotesca, and the French grotesque.

ANTICLEA, in classical history, a daughter of Autolycus and Amphithea. Her father, a famous robber, permitted Sisyphus, son of Æolus, to enjoy the favors of his daughter, and Anticlea was really pregnant of Ulysses when she married Laertes king of Ithaca. Laertes was nevertheless the reputed father of Ulysses. Ulysses is reproached by Ajax in Ovid's Metamorphoses as being the son of Sisyphus. It is said that Anticlea killed herself when she heard a false report of her son's death.—*Homer. Odys.* xi. 19.

ANTICNEMION; from *αντι*, and *κνημη*, the shin-bone; in anatomy, the shin, or the fore prominent part of the tibia.

ANTICOR, or ANTICOEUR, among horses, an inflammation in a horse's throat, is the same with the quinsy in mankind. See FARRIERY.

ANTICOSTI, an uninhabited island of considerable size at the mouth of the river St. Lawrence, included in the government of Newfoundland. Its eastern point is in 62° W. long. and N. lat. 49° 5′. Its west point in W. long. 64° 35′ and N. lat. 49° 48′. Throughout its entire extent of 125 miles in length and 30 in breadth, it possesses not a single harbour where a vessel can safely ride. The forest wood that is found on it is stunted in growth; and the climate from its severity, and the soil from its general unfruitfulness, have hitherto deterred the British authorities from attempting a permanent settlement here. The French are said to have formed an establishment on the island during their possession of Canada; no trace of it however now remains: but in 1809 two officers were appointed to reside at different parts of the coast to relieve vessels in distress, receive shipwrecked mariners, &c.

ANTICUM, in architecture, a porch before a door; also that part of a temple which is called the outer temple, and lies between the body of the temple and the portico. It is sometimes called antæ.

ANTICYRA, in ancient geography, a town in Phocis, on the Corinthian bay, opposite to Cirrha, to the west on the same bay. The Phocians seizing the temple of Apollo at Delphi, a war, called the sacred, commenced, and lasted ten years; when Philip, father of Alexander the Great, avenged the god by destroying many of the cities of the pillagers. Anticyra was one of them. It was again taken and subverted by Attilius, a Roman general, in the war with the Macedonians. It afterwards became famous for its hellebore. This drug was the root of a plant, the chief produce of the rocky mountains above the city, and of two kinds; the black, which had a purgative quality; and the white, which was an emetic. Sick persons resorted to Anticyra to take the medicine, which was prepared there by a peculiar and very excellent recipe: hence the adage, Naviget Anticyram. By the port in the second century was a temple of Neptune, not large, but built with selected stones, and the inside white-washed; the statue of brass. The agora or market-place was adorned with images of the same metal; and above it was a well with a spring, sheltered from the sun by a roof supported by columns. A little higher was a monument formed with such stones as occurred, and designed, it was said, for the son of Iphitus. One of these, Schedius, was killed by Hector, while fighting for the body of Patroclus, but his bones were transported to Anticyra; where his brother died after his return from Troy. About two stadia, or a quarter of a mile distant, was a high rock, a portion of the mountain on which a temple of Diana stood, the image, a gigantic woman made by Praxiteles. The walls and other edifices at Anticyra were probably erected, like the temple of Neptune, with stones or pebbles. The site is now called Asprospitia, or The White Houses; and some traces of the buildings from which it was so named remain. The port is land-locked, and frequented by vessels for corn. Some paces up from the sea is a fountain.

ANTIDACTYLUS; from *αντι*, and *δακτυλος*, dactyl; a name given by some to the anapæst, which is the reverse of a dactyl, and consists of two short syllables and one long: e. g. prĕ'ăs.

ANTIDÆMONICA; from *αντι*, and *δαιμον*, dæmon; in ecclesiastical history, a sect who denied the existence of devils, or evil spirits; also all spectres, incantations, witchrafts, &c.

ANTIDESMA, in botany, a genus of the diœcia order, and pentandria class of plants. CAL. of the male five-leaved; no corolla; the antheræ bifid: female CAL. five-leaved; the corolla wanting: STIGM. five; the berry cylindric and one-seeded. There is but one species, viz. A. alexiteria, a native of India.

ANTIDICOMARIANITES; from *αντιδικος*, adversary, and *Μαρια*, Mary; an ancient sect, esteemed heretics, who denied the perpetual virginity of the virgin Mary, and asserted that she had several children by Joseph after our Saviour's birth. They were the disciples of Helvidius and Jovinian, and appeared in Rome towards the close of the fourth century.

ANTIDORON, in ecclesiastical writers, a name given by the Greeks to the consecrated bread, out of which the middle part marked with the cross, wherein the consecration resides, being taken away by the priest, the remainder is distributed after mass to the poor. On the sides of the antidoron are impressed the words Jesus Christus vicit. The word is formed from *δωρον*, donum, a gift, as being given away loco muneris, or in charity. The antidoron is also called panis præsanctificatus.

ANTIDOSIS; from *αντι*, and *διδωμι*, to give; in antiquity, denotes an exchange of estates, practised by the Greeks on certain occasions, with peculiar ceremonies, and first instituted by Solon. When a person was nominated to an office, the expense of which he was not able to support, he had recourse to the antidosis; that is, he was to seek some other citizen of better substance than himself, who was free from this and other offices, in which case the former was excused. In case the person thus substituted denied himself to be the richest, they were to exchange estates after this manner: the doors of their houses were close shut up and sealed that nothing might be conveyed away; then both took an oath to make a faithful discovery of all their effects, except what lay in the silver mines, which by the laws was excused from all imposts; accordingly, within three days, a full discovery and exchange of estates were made.

ANTIDOTARY is used by some writers for a dispensatory. We have antidotaries of several authors, as those of Meuse, Rhasis, &c.

ANTIDOTE, *v.* & *n.*
ANTI'DOTAL,
ANTI'DOTALLY.

Αντι, against, and *δοτον*, given, from *διδωμι*, to give, Something given to prevent the effects of what has been already received; a preventive; a counterpoison.

Particular discontents and grievances are either of body, minde, or fortune, which, as they wound the soul of man, produce this melancholy and many great inconveniences, by that *antidote* of good counsell and perswasion may be eased or expelled.

Burton's Anatomy of Melancholy.

The universal *antidote* for all the judgments of God is our humble repentance. *Hall's Contemplations.*

To wake thy dead devotion was my point;
And how I bless night's consecrating shades,
Which to a temple turn an universe;
Fill us with great ideas, full of heaven,
And *antidote* the pestilential earth.
Young's Complaint. Night 9th.

Trust not the physician;
His *antidotes* are poison, and he slays
More than you rob. *Shakspeare.*

What fool would believe that *antidote*, delivered by Pierius, against the sting of a scorpion? to sit upon an ass, with one's face towards his tail.
Brown's Vulgar Errors.

Poison will work against the stars: beware;
For ev'ry meal an *antidote* prepare. *Dryden jun.*

Thus am I doubly arm'd, my death and life,
My bane and *antidote*, are both before me.
This in a moment brings me to an end;
But this informs me I shall never die.
Addison's Cato.

The safe and general *antidote* against sorrow is employment. *Rambler.*

ANTIDOTE. The Indian physic consists much in the use of antidotes. The root mungo, and the viper-stone, are held sovereign antidotes against the bite of the cobra di capello, and other venomous creatures.

ANTIENNE, in music, the commencement of a chant; preliminary verse of a psalm; a species of prelude. Each church mode is announced by an antienne; and each antienne has its peculiar mode for the purpose of blending itself with the following chant or psalm. In order to ascertain the mode peculiar to those psalms which do not always commence with the tonic, the cadence is indicated by the word evovæ. The connexion of the antienne with the following psalm is expressed in ancient Roman Catholic music by a figure of two notes, and the word evovæ is written to show the commencement of the cadence, which governs the key or mode. But this rule is not strictly adhered to in the compositions of plain chant of later date. Rousseau, in his Dictionary of Music, simply says, That the antiennes have been thus called because they were sung originally by two choirs answering each other alternately, and that under this title was understood the anonce to the hymns and psalms sung in churches.

ANTIGENIDAS, a celebrated Greek musician of Thebes, and flute master to Alcibiades, until his pupil discarded the instrument on account of the distortion it produced in his countenance. Antigenidas is said to have held the taste of the commonalty in such contempt, that hearing a flute player at a distance saluted with a violent burst of applause, he observed, 'There must be something very bad in that man's performance, or those people would not be so lavish of their approbation.'

ANTIGGA, PUNTA DE LA, a cape on the north coast of the island of Guadaloupe.

ANTIGNY, a town in the Swiss canton of Fribourg, eight miles S. W. of the town of that name.

ANTIGONE, in fabulous history, the daughter of Œdipus king of Thebes, who led her father when blind and banished. She was slain by the usurper Creon, whose son Hæmon, being in love with her killed himself upon her tomb. Her death was avenged upon Creon by Theseus.

ANTIGONEA, or ANTIGONIA, in ancient geography, 1. A city of Bithynia, so called from Antigonus the son of Philip, and afterwards Nicæa. 2. In Epirus, to the north of the Montes Ceraunii, opposite the city of Oricum. 3. In Arcadia, so called in honor of king Antigonus. 4. In Macedonia, in the territory of Mygdonia. 5. In Chalcidice, in Macedonia, on the east side of the Sinus Thermaicus. 6. In Syria, built by Antigonus, not far from Antioch, on the Orontes; but soon after destroyed by Seleucus, who removed the inhabitants to Seleucia, a town built by him. And 7. One in Troas, called Alexandrea, in Pliny's time.

ANTIGONUS, king of Asia, one of the captains of Alexander the Great, was the son of Philip, a Macedonian nobleman. Upon the death of Alexander, when a division of the provinces took place, Pamphylia, Lycia, and Phrygia Major, fell to his lot; and after the death of Perdiccas that of Lycaonia was added. He was entrusted with the command of the Macedonian household troops, and when Eumenes was declared a public enemy, he was ordered to prosecute the war against him with the utmost vigor. Eumenes was defeated at the beginning of this war, and forced to retire with 600 brave followers to an inaccessible castle on a rock; and his friends, having assembled a new army for his relief, were also routed by Antigonus, whose ambitious projects began now to be manifest. After Antipater's death, Polysperchon succeeding as tutor to the young king of Macedon, Antigonus aspired at the lordship of all Asia. The power of Eumenes made Antigonus greatly desire his interest; but that faithful commander, escaping from the fortress in which he was blockaded, raised an army, and was appointed the royal general in Asia. In conjunction with the governors of Upper Asia, he was successful in several engagements against Antigonus; but was at last betrayed and put to death, and the governors who had joined him submitted to Antigonus. After this, seizing the treasures at Babylon, Seleucus fled to Ptolemy, with whom, and Lysimachus and Cassander, he entered into a confederacy for the purpose of curbing the power of Antigonus. But the latter, with his son Demetrius, prevailed in subduing Syria and Phœnicia, in forcing the Nabathæan Arabs near Judea to his terms, and in expelling Seleucus from Babylon. Upon which the confederates were obliged to allow him the possession of all Asia, except the Greek cities, which were to continue free. This treaty was soon violated; and Ptolemy made a successful descent in Lower Asia, and on some islands of the Archipelago, but was defeated by Demetrius, who took Cyprus with many prisoners. On this victory Antigonus assumed the title of king, and bestowed the same on his son; and from this time, A.A.C. 306, his reign in Asia, Ptolemy's in Egypt, and Alexander's other captains in their governments, properly commence. He had not long borne this

title when Cassander, Seleucus, and Lysimachus, again combining against him, defeated the forces under him and his son at Ipsus; and in this battle he fell, in the eighty-fourth year of his age, A.A.C. 301. Antigonus was ardent in his passions, and often used improper means for their gratification; but he was a sagacious, active, brave, and fortunate warrior, and in private concerns strictly just.

ANTIGONUS, king of Judea, the son of Aristobulus. He entered into an alliance with the king of the Parthians and besieged Jerusalem. He cut off his uncle Hyrcanus's ears to incapacitate him for the high-priesthood, and put Joseph, Herod's brother, to death. At length Herod took him and sent him to Mark Antony; who to gratify Herod cut off his head, and thereby extinguished the Asmonean race, who had reigned 126 years. This happened A.A.C. 36.

ANTIGONUS GONATAS, son of Demetrius Poliorcetes, and grandson of Antigonus king of Asia. He was eminently distinguished by his filial affection, humanity, and mild disposition. At his father's death, which he greatly lamented, he succeeded him in all his European dominions, as well as in the kingdom of Macedon and other cities in Greece. The Gauls having invaded his country, he defeated and expelled them; but not long after Pyrrhus, king of Epirus, routed him. Yet when Pyrrhus was slain at Argos, and his head brought to Antigonus by his son, he was much displeased; and covering it with his robe, ordered the body to be searched for and honorably interred. His kind treatment of Helenus, the son of that unfortunate king who had fallen into his hands, was equally singular. The taking of the city of Corinth by intrigue was the meanest action of his reign, but by this he maintained the freedom of the small states of Greece and enlarged his own dominions. By cultivating the arts of peace, he not only secured the affections of his subjects to himself, but to his descendants. His designs were opposed by the Achæans, headed by Aratus, who recovered Corinth; but he pursued his plan, and left his kingdom in peace about the eightieth year of his life and thirty-fourth of his reign, A.A.C. 243, and was succeeded by his son Demetrius II.

ANTIGONUS the Second, surnamed Doson, king of Macedonia, the son of Antigonus I. succeeded his brother Demetrius II., A.A.C. 225; and was soon after chosen commander-in-chief of the Achæan forces by sea and land. The league being greatly strengthened by the accession of the Epirotes, Bœotians, Phocians, Arcadians, and Thessalians, Cleomenes III. king of Sparta, raised a great army to oppose Antigonus; but being deserted by his allies, the Argives, he was obliged to retreat to defend his own kingdom after destroying Megalopolis. Antigonus, after taking a number of cities, completely defeated Cleomenes at Selasia, who fled to Egypt after the battle, leaving Lacedæmon open to the victorious army, A.A.C. 221. Antigonus, however, used his victory with great moderation, giving the Spartans a free republican government, and restoring their ancient laws, which their late sovereign had greatly altered. After this the barbarians having attacked Macedonia, Antigonus returned and put them to flight, but did not long enjoy his good fortune, for he died next year and was succeeded by his nephew Philip VI. A.A.C. 220.

ANTIGRAPHE; from *αντι*, and *γραφω*, I write; in antiquity, denotes a law-suit about kindred, whereby a person claimed relation to a particular family.

ANTIGRAPHUS, in antiquity, an officer of Athens who kept a counterpart of the apodecti, or chief treasurer's accounts, to prevent mistakes, and keep them from being falsified.

ANTIGRAPHUS, in ecclesiastical writers, an abbreviator of the papal letters, in which sense the word is used by pope Gregory the Great in his register.

ANTIGRAPHUS, or ARCHIGRAPHUS, in writers of the middle age, a secretary or chancellor so called, on account of his writing answers to the letters sent to his master.

ANTIGRAPHUS is also used by Isidorus for one of the notes of sentences marked with a dot, to denote diversity of sense in translations.

ANTIGUA, formerly written Antigoa and Antega, one of the largest of the Leeward Caribee islands, and the residence of the governor or captain general. It lies about ten leagues north-east of Montserrat, and twenty east of St. Christopher; is upwards of fifty miles in circumference and contains according to Edwards 59,838 acres of land, an estimate followed in 1813 by Mr. Colquhoun. Of these, 44,838 acres are in a state of cultivation; 34,000 of them being laid out in sugar plantations; tobacco, cotton, and wool, are the other staple productions of the island, which also has some good pasturage, and grows large quantities of provisions in favorable seasons. The numbers of slaves in this island were reported by the Privy Council, in 1788, as amounting to 36,000; in 1817 there were but 31,451: the free blacks 438, the free people of color 1747, and the whites, exclusive of troops, 2102. Edwards considered the island to be in a declining state at the period of the publication of his valuable work; but it is remarkable that since the abolition of the slave trade, i. e. from 1807 to the present period, the slaves have multiplied to the number of about an additional 1200.

The soils of the island are a black mould on a substratum of clay, and a stiff clay on a substratum of marl. When the former is sufficiently irrigated it is extremely rich, but the island is occasionally subject to excessive droughts, and contains not one single rivulet or spring. The latter description of soil is less productive, and so much over-run with an irradicable species of grass that some estates, once in tolerable cultivation, have been entirely abandoned, and others converted into pasture lands, as a dernier resort. It is not possible from these causes to obtain any regular estimate of the annual quantity of sugar and other productions growing in Antigua. They vary into all proportions: in 1779 were shipped 3,382 hogsheads, and 579 tierces: in 1782, 15,102 hogsheads and 1,600 tierces: in the years 1770, 1773, and 1778, there were no crops, severe droughts having destroyed all the canes and nearly exposed the negroes to absolute famine. The climate is warmer than that of Barbadoes, and fully as much exposed to hurricanes. The abbé Raynal thinks that a good season should produce eighteen or twenty millions' weight of raw sugar and a proportionable quantity of rum: Mr. Edwards thought 17,000

hogshead; of sugar of sixteen cwt. is a good crop. Black cattle, hogs, and fowls, are plentiful; and the rain-water, that is preserved, remarkably pure and light.

The island of Antigua was discovered, with St. Christopher's, by Columbus in his second voyage: the brother of that great navigator notices that its Indian name was Jamaica, signifying, in the dialect of the Carribs, a land abounding with springs: Alcedo the Spanish geographer says that the English discovered them. It is certain, however, that no such tidings ever reached the mother country. Columbus called the island Antigua from the church of St. Maria de la Antigua at Seville; and from this period to 1632 we hear nothing of its history. The French, who had been accidentally established at St. Christopher's, seem at that time to have first entertained the idea of settling in Antigua. A few English families, however, first removed thither, and attempted the cultivation of tobacco. Amongst them was an ancestor of the family of Warner, which still possesses considerable estates on the island. In 1663 the first regular grant of this island was made by king Charles II. to Lord Willoughby, of Parham, the governor of Barbadoes; who nominated his kinsman Henry Willoughby as his deputy. Several French families had by this time arrived at Antigua; and, various quarrels arising between them and the new governor, they are said to have induced their countrymen at Martinique to project an expedition against the island. An overpowering French armament at any rate arrived here in 1666, which desolated the colony nearly to utter ruin; the plantations were entirely depopulated of their negroes, the houses and produce committed to the flames, and the proprietors plundered and massacred without respect to age, sex, or condition. In 1668 the treaty of Breda restored Antigua to the English; but its entire recovery from the depredations of the French, is attributable to the exertions of Colonel Codrington of Barbadoes, who strongly advised and countenanced the introduction of the sugar-cane into the colony. This measure he followed up with every possible exertion in favor of Antigua, when subsequently appointed captain-general and commander-in-chief of the Leeward Carribee Islands; so that in 1690 it commanded a disposable force of 800 men, 'a quota,' says Mr. Edwards, 'which gives room to estimate the whole number of its white inhabitants, at that time, at upwards of five thousand.' If this be a just estimate, the island would appear to have attained a degree of prosperity it has not latterly known.

At the beginning of the last century we find the assembly of Antigua at issue with the government at home, on the subject of the currency of the island. But this dispute was soon forgotten in a more remarkable transaction, that exhibits the spirit of its inhabitants, and the equity of the mother country in an interesting point of view. Daniel Park, Esq. a native of Virginia, had, through the interest of the Duke of Marlborough, been appointed to the government of the Leeward Isles. He was a debauchee in early life, but having served successfully under that great general in the Netherlands, and being deputed to bring home tidings of the victory of Hochset to queen Anne, he attracted the notice of the court, and was appointed to succeed general Matthews, the successor of colonel Codrington in 1706. The colonists received him with great cordiality as a court favorite; and the assembly at Antigua added £1000 to his income; in return for which his whole conduct as a governor exhibited but one train of public and private outrages. Having seduced the wife of one of the most respectable inhabitants, who had the misfortune shortly afterwards to kill a man by accident, he endeavoured to procure a verdict of wilful murder against the incensed husband, interfered most indecently in the impannelling of the jury, and declared it to be amongst his prerogatives to direct the mode of their formation, as well as that of the election of the assembly. 'It was soon observed of him,' says Edwards, 'as it had formerly been of another detestable tyrant, that he spared no man in his anger, nor woman in his lust.' The respectable part of the inhabitants, to the number of eighty, now demanded his recal, and after various abortive efforts to procure it from the hands of his patrons at home, they at last had the satisfaction of seeing their agents arrive from England with letters of dismissal, and a commission to examine witnesses respecting the matters of complaint. But Park had now the assurance to refuse to obey the Queen's letters, and issued orders for the dissolution of the assembly. He declared he should remain in the government for the sake of vindicating his innocence, and surrounded himself with all the troops he could prevail upon to obey him. The night of the dispersion of the assembly, and all the following day, were occupied by its most active members, in summoning the people of the interior to their aid. The populace were now enraged against him beyond measure; the assembly continued sitting until he surrounded their house with soldiers, whose principal commanders refused to act, not knowing whom to obey; and all the affairs of the island were sinking into anarchy. We give the result in the words of Mr. Edwards:—

'On Thursday the 7th of December, 1710, early in the morning, about five hundred men appeared in arms in the town of St. John's, where colonel Park had been making provision for resistance in case of attack. He had converted the government-house into a garrison, and stationed in it all the regular troops that were in the island. On the approach of the inhabitants, however, his courage failed him. The sight of an injured people coming forward as one man, with deliberate valor, to execute on his person that punishment which he must have been conscious his enormities well merited, overwhelmed him with confusion and terror. Although he must have been apprised that his adversaries had proceeded too far to retreat, he now for the first time, when it was too late, had recourse to concession. He despatched the provost-marshal with a message, signifying his readiness to meet the assembly at Parham, and to consent to whatever laws they should think proper to pass for the good of the country. He offered at the same

time, to dismiss his soldiers, provided six of the principal inhabitants would remain with him as hostages for the safety of his person. The speaker of the assembly and one of the members of the council, unwilling to carry matters to the last extremity, seemed inclined to compromise, and proposed themselves as two of the hostages required by the governor; but the general body of the people, apprehensive that further delay might be fatal to their cause, called aloud for immediate vengeance, and instantly marched forward in two divisions. One of these led by Mr. Piggot, a member of the assembly, taking possession of an eminence that commanded the government-house, attacked it with great fury. The fire was briskly returned for a considerable time, but at length the assailants broke into the house. The governor met them with firmness, and shot Piggot dead with his own hand, but received in the same moment a wound which laid him prostrate. His attendants, seeing him fall, threw down their arms; and the enraged populace, seizing the person of the wretched governor, who was still alive, tore him into a thousand pieces, and scattered his reeking limbs in the street. Besides the governor, an ensign, and thirteen private soldiers who fought in his cause, were killed outright, and a lieutenant and twenty-four privates wounded: of the people thirty-two were killed and wounded, besides Mr. Piggot. The governor's death instantly put an end to this bloody conflict.

The government at home, with a wisdom rarely surpassed, enquired sufficiently into the character of its representative to find it most flagitious, and wholly undeserving of vindication; and shortly after issued a pardon to all persons concerned in Mr. Park's death.

Antigua, as we have noticed, is the principal residence of the governor or captain-general of the Leeward Carribee Islands. Here he holds a court as chancellor, and in causes arising within the island is assisted by a council, who, by their president, can proceed with business during his absence. But in all cases arising in the other islands of his government he sits alone. There is a court of king's bench at Antigua, of common pleas, and of exchequer. The legislature is composed of the governor, a council of twelve, and an assembly of twenty-five members. It had the honor of first awarding to Negro slaves the right of trial by jury; and the more equivocal privilege of an interval of four days, in all capital convictions, between the passing of the fatal sentence and its being carried into execution.

Two regiments of infantry and two of militia, generally form its permanent military establishment; in addition to which, a battalion of artillery and a squadron of dragoons are raised on the island. The regular troops receive here, as at Jamaica, an additional pay from the island.

Encircled with a range of hills, which run to a considerable height on the south or south-west, none of our West India Islands possess finer harbours than Antigua. St. John's, Parham, and English harbour, are the principal; the first two being legal ports of entry, and the first and last strongly fortified. At English harbour, is a royal arsenal and dock-yard, with conveniences for careening large vessels.

Internally, Antigua is divided into eleven districts and six parishes, containing six towns of moderate size. St. John's (the capital), Parham, Falmouth, Willoughby Bay, Old Road, and James Fort.

Very meritorious exertions for the civilisation of the negroes have been made in this island by the Moravians, who in Edwards's time ranked between 5,000 and 6,000 slaves among their converts. The practical good habits and the knowledge of the useful arts which these missionaries have the happy faculty of promoting, in union with their religious objects, cannot be too much held up to the imitation of their competitors in this field of benevolent labor.

In the year 1809 the official value of the imports of Antigua were £198,121: the exports £216,000: in 1810, imports, £285,458; exports £182,392. In 1813 Mr. Colquhoun estimated the aggregate value of its productions at £898,220.

The quantities of coffee, sugar, rum, and cotton-wool, exported into Great Britain from Antigua in 1809 and 1810, were as follows:

	COFFEE.		SUGAR.		RUM.	COTTON-WOOL.
	British plant.	For. plant.	British plant.	For. plant.		
	cwt.	cwt.	cwt.	cwt.	gall.	lbs.
1809	309	3,983	106,150	629	143,223	112,016
1810	40	2,164	188,799	3,821	77,092	39,880

ANTIGUGLER is a crooked tube of metal, bent so as to be easily introduced into the necks of bottles, and used in decanting liquors without disturbing them. For this purpose the bottle should be a little inclined, and about half a spoonful of the liquor poured out, so as admit an equal quantity of air; let one end of the bent tube be stopped with the finger whilst the other is thrust into the body of the liquor near to the bubble of air already admitted. When the finger is taken off the bottle will have vent, and the liquor will run out steadily and undisturbed. See SIPHON.

ANTIHECTICS; from αντι and εκτικος; in pharmacy, medicines good in hectical disorders.

ANTIHECTICUM POTERII, the name of a medicine formerly much celebrated, but now laid aside in common practice. It was prepared from a mixture of tin with the regulus of antimony, and fixed with saltpetre.

ANTIHYPNOTICS; αντι, and υπνωτικος, sleepy; medicines that prevent sleep.

ANTIHYPOCHONDRIACS; from αντι, and υποχονδριακος, hypochondriac; medicines against melancholy.

ANTILEGOMENA, in Scripture criticism, an expression denoting doubtful, but acknowledged by most to be genuine, one of the three classes into which Eusebius has distributed the books of the New Testament; the other two are

homologoumena, i. e. of undoubted authority, and notha or spurious. To this class he refers the Epistles ascribed to James and Jude, the second of Peter with the second and third of John, whether they were written by the evangelist, or by another person of the same name. He is of opinion that these books may be received as genuine productions of the apostolic age, even if they were not written by the evangelists.

ANTILEPSIS, in surgery, the hold of a bandage to keep it from slipping.

ANTILEXIS; from *αντιλεγω*, I contradict; in antiquity, denotes a new trial granted in the Athenian judicatories, where judgment had before passed against a party for non-appearance.

ANTILIBANUS, in ancient geography, a mountain of Cœlosyria, which bounds it on the south, running parallel with Libanus; they both begin a little above the sea, Libanus near Tripolis, Antilibanus at Sidon, and terminate near the mountains of Arabia, which run to the north of Damascus, and the mountains of Traconitis, and there end in other mountains. In the Scriptures no distinction is made between Libanus and Antilibanus, both being denominated by the common name Lebanon.

ANTILLARUM, in conchology, a species of nerita very frequent on the shores of the Antilles Islands.

ANTILLARUM, in ornithology, a species of falco, described in l'Histoire des Antilles, tom. ii. p. 252, under the name of mansfenny, after Buffon; and called le faucon des Antilles by Brisson, Orn. i. p. 361. This is the falco Antillarum of Gmelin, and mansfenny of Latham. It is found in the Antilles or Carribee Islands, &c.

ANTILLES, (formed, as some writers suppose, of ante islas, i.e. islas ante el Continente, islands before the Continent,) a name that has been variously applied to the West India Islands, but principally to the whole group which divides the Carribean sea from the Atlantic, situated between the tenth and twenty-fourth degrees of north latitude, and extending from the coast of Brasil to that of Florida. These again have been distinguished according to their size, into the Greater and Less Antilles, and the Windward and Leeward Islands. The Windward Islands, according to the general understanding of British mariners, stretching from Trinidad to Martinico, and the Leeward Islands from Dominica to Porto Rico. The Spanish word Antilles, therefore, is of little actual utility in geographical classification. Many of these were originally called the Carribean islands by Columbus, from the warlike character of their original tribes. The French call the whole the Windward Islands, as being toward the east of America; and Mr. Pinkerton proposes the new but very proper designation of the Isles of Colon, the original name of the discoverer of America. We shall be careful to attend to each of their claims on our notice in their alphabetical order.

ANTILOCHUS, the eldest son of Nestor by Eurydice. He went to the Trojan war with his father, and was killed by Memnon the son of Aurora: Homer, Od. 4. Ovid, Heroid. says he was killed by Hector.—A poet who wrote a panegyric upon Lysander, and received a hat filled with silver; Plut. in Lys.: and an historian commended by Dionys. Halicarn.

ANTILŒMICS; from *αντι*, and *λοιμος*, the pestilence; medicines against the plague.

ANTILOGY, *αντιλογια*, a contradiction. Tirinus has published a large index of the seeming antilogies of the Bible, i. e. of texts which apparently contradict each other, but which are all explained and reconciled by him in his comments on the Bible. Dom. Magri, a Maltese of the oratory in Italy, has attempted the like, but he has done little more than rehearse what occurs of that kind in the principal commentators.

ANTILUTHERANS, a sect among the ancient reformers who maintained opinions, chiefly in relation to the eucharist, different from those of Luther. Such were Carolostadius and his followers, called Sacramentarians; and those of Zuinglius denominated Zuinglians. The sect of Antilutherans, at first confined within narrow bounds, in a few years time subdivided into six or seven inferior sects, and ere long into a larger number more variously denominated.

ANTILYSSUS PULVIS, in medicine, is composed of equal parts of the lichen cinereus terrestris et piper niger. It is reckoned useful in preventing the rabies canina.

ANTIMACHUS, a poet, a native of Colophon, who is supposed to have lived in the fifth century before Christ. He ranked in reputation next to Homer; and the emperor Adrian, who placed Ennius before Virgil, even preferred him to that poet, a circumstance which renders the loss of his writings a subject of great regret. The names of two of his works, the Thebaid and the Lydian, are preserved, and a fragment of Antimachus is to be found in the Analects of Brunck: the rest of his remains were published in 1786 by Schellenburgh, under the title of Antimachi Colophonii Reliquiæ.—*Vossius. Fabricius.*

ANTIMENSIUM, a consecrated table-cloth, occasionally used in the Greek church in places where there is no proper altar. It answers to the altare portabile, or portable altar, in the Latin church. The origin of the antimensia is thus described by Meursius: when the bishop had consecrated a church, the cloth which had been spread on the ground and over the communion table, was torn in pieces and distributed among the priests, who carried each a fragment away to serve to cover the tables in their churches and chapels; not that it was necessary that such cloths should be laid on all tables, but only on those which either were not consecrated, or whose consecration was doubtful.

ANTIMENSIUS, an ancient officer in the Greek church, whose business was to introduce and place the communicants at the eucharist.

ANTIMERIA; from *αντι*, and *μερος* a part; in grammar, a figure where one part of speech is used for another: e. g. vellè suum cuique est, for voluntas sui cuique est; also, populus late rex, for populus late regnans. Antimeria, in a more restrained sense, is a figure whereby the noun is repeated instead of the pronoun. The antimeria is frequent in the Hebrew, and is sometimes retained in our version of the Old Testament: e. g. 'hear my voice, ye wives of Lamech,' for my wives. Gen. iv. 23.

ANTIMETABOLE, in rhetoric, a figure which sets two things in opposition to each other. The word is Greek, compounded of *αντι*, against, and *μεταβολη* from *μεταβαλλω*, I shift or transfer; i. e. a shifting, or setting two things over against each other. This figure is beautifully exemplified in an apophthegm of Musonius; which, on account of its excellence, is called aureum monitum, the golden maxim or precept: *Ἂν τί πράξης καὸλν μετὰ πόνε, ὁ μὲν πόνος ὄιχεται, τὸ δὲ καλόν μένει. Ἂν τὶ ποιησης αισχρὸν μετὰ ἡδονης, τὸ μὲν ἡδὺ ὄιχεται, τὸ δε αισχρὸν μένει.* q. d. 'Allowing the performance of an honorable action to be attended with labor, the labor is soon over, but the honor immortal; whereas, should even pleasure wait on the commission of what is dishonorable, the pleasure is soon gone, but the dishonor eternal.'

ANTIMETATHESIS; from *αντι* and *μεταθημι*, I transfer; in rhetoric, is the inversion of the parts or members of an antithesis. Such is that of Cicero against Verres, lib. iv. c. 52. 'Compare this peace with that war, the arrival of this governor with the victory of that general, his profligate troops with the invincible army of the other, the luxury of the former with the temperance of the latter; you will say that Syracuse was founded by him who took it, and taken by him who held it when founded.'

ANTIMISIUM, in antiquity, a table placed before the Roman tribunal or judgment-seat. What relation this has to the antimensia in the Greek church does not appear: some writers suppose them the same.

ANTIMONARCHOMACHI, } from *αντιμο-*
ANTIMONARCHOMACHISTS; } *ναρχος*, and *μαχη*, contest; is sometimes used by political writers, to denote maintainers of monarchical or absolute power vested by divine right in the persons of princes. In which sense antimonarchomachi stand opposed to monarchomachi. King James I., Salmasius, Peter du Moulin, bishop Bramwell, Albericus Gentilis, Ziegler, William and George Barclay, Bochart, &c. have distinguished themselves in the class of antimonarchomachists. Acker has treated professedly of the monarchomachists and antimonarchomachists.

ANTIMONIAL CUP, a cup made either of glass of antimony, or of antimony prepared of salt petre. Though a substance indissoluble by the stomach, it will give a strong cathartic or emetic quality to any liquor poured into it, without any diminution of its own weight.

ANTIMONY, in mineralogy, the *στιμμι* of Dioscorides; *Στιμμι γυναικειον*, Gr.; Stibium Jarbason, Lat.; Spiessglas, Spiessglanz, Germ.; Spitsglas, Swed.; Spidsglas, Dan.; Pisgotz, Hung.; Antimoine, Fr.; Antimonio, Ital.; Antimonja, Russ.; Proteus, leo ruber, plumbum nigrum, balneum regis, lupus metallorum, Alchem. It has been thought to be the *τετράγωνον* of Hippocrates; the lapis spumæ candidæ nitentisque, non tamen translucentis, of Pliny; and the antimonium of Bazil Valentine, a metallic solid, heavy, brittle, substance, probably so called from *αντι*, against, and *μονον*, alone, i. e. an enemy to solitude, because it is very seldom found pure, but mixed with some other metals. Antimony is mostly found of a dusky white color, very brittle, and of a plated or scaly texture.

The ores of antimony, it is thought, have not been analysed with sufficient accuracy to admit of arrangement according to the nature of their contents. Their external characters must therefore be considered: I. Native antimony, of which there are two species; dodecahedral, and octohedral. 1. Dodecahedral. Color tin-white. Massive and crystallised in an octohedron and dodecahedron. Harder than calcareous spar. Sp. gr. 6.7. It consists of 98 antimony, 1.0 silver, and 0.25 iron. It is found in argentiferos veins in the gneiss mountains of Chalanches in Dauphiny, and at Andreasberg in the Hartz. 2. Octohedral antimony; of which there are two sub-species, the antimonial silver, and arsenical silver. II. Antimony Glance. Under this genus are ranged the following species, sub-species, and kinds: 1. Compact gray antimony. Colour light lead-gray. Massive. Soft. Easily frangible. Sp. gr. 4.4. Found in Huel Boys mine in Cornwall. 2. Foliated gray antimony. Color like the preceding. Cleavage prismatic. Not particularly brittle. Sp. gr. 4.4. 3. Radiated gray antimony. Color common lead-gray. Massive and crystallised in four and six-sided prisms, and sometimes in acicular crystals. Lustre metallic. Sp. gr. 4.4. It melts by the flame of a candle. Its constituents are, antimony 75, sulphur 25. These minerals occur in veins, in primitive and transition mountains. This occurs in Glendinning, in Dumfriesshire, in Cornwall, &c. 4. Plumose gray antimony. Color between dark lead-gray and smoke-gray. Massive, and in capillary glistening crystals. Lustre semi-metallic. Very soft. It melts into a black slag. It contains antimony, sulphur, arsenic, iron, and silver. It occurs in veins in primitive rocks, at Andreasberg in the Hartz, &c. 5. Axifrangible antimony glance or Bournonite. Color blackish lead-gray. Massive and crystallised. Primitive form, an oblique four-sided prism, which occurs variously modified by truncation, &c. Lustre metallic. Cleavage axifrangible. Fracture conchoidal. Brittle. Sp. gr. 5.7. Its constituents are, lead 42.62, antimony 24.23, copper 12.8, iron 1.2, sulphur 17.—Hatchett. It is found near Endellion in Cornwall. 6. Prismatic antimony glance. Color blackish lead-gray. Primitive form, an oblique four-sided prism. Lustre metallic. Cleavage in the direction of the smaller diagonal of the prism. Sp. gr. 5.75. III. Antimony ochre. Color straw-yellow, incrusting crystals of gray antimony. Dull. Fracture earthy. Very soft. Brittle. Whitens and evaporates before the blowpipe. It occurs in veins in Saxony, &c. IV. Nickeliferous gray antimony. Color steel-gray. Massive. Shining. Cleavage double rectangular. Fragments cubical. Brittle. Sp. gr. 6 to 6.7. It melts before the blowpipe, emitting white vapor of arsenic. It communicates a green color to nitric acid. It consists of antimony with arsenic 61.68, nickel 23.33, sulphur 14.16, silica, with silver and lead 0.83, and a trace of iron. It occurs in veins near Freussberg in Nassau. V. Prismatic white antimony. Color white. Massive and crystallised, in a rectangular, four-sided

prism, an oblique four-sided prism, a rectangular four-sided table, a six-sided prism, and in acicular and capillary crystals. Lustre pearly or adamantine. Cleavage in the direction of the lateral planes. Translucent. Sectile. Sp. gr. 5.0 to 5.6. It melts and volatilises in a white vapor. Its constituents are, oxide of antimony 86, oxides of antimony and iron 3, silica 8. It occurs in veins in primitive rocks in Bohemia and Hungary. VI. Prismatic antimony-blende, or red antimony. *a.* Common. Color cherry-red. Massive, in flakes, and crystallised. Primitive form, an oblique four-sided prism. Crystals delicate capillary. Adamantine. Translucent on the edges. Brittle. Sp. gr. 4.5 to 4.6. It melts and evaporates before the blowpipe. It consists of antimony 67.5, oxygen 10.8, sulphur 19.7. *Klapr.* It occurs at Braunsdorf in Saxony. *b.* Tinder antimony-blende. Color muddy cherry-red. In flexible tinder-like leaves. Feebly glimmering. Opaque. Streak shining. Friable. Sectile and flexible. It contains oxide of antimony 33, oxide of iron 40, oxide of lead 16, sulphur 4, with some silver. *Link.* It occurs in Carolina and Dorothea mines at Clausthal.

The most beautiful specimens of the ores of antimony, according to a late intelligent naturalist, are, with their several descriptions, as follows: 1. Species II. variety the third of former eminent naturalists a sulphurated A. Gray antimonial ore, var. striated. Strahliges graues spiessglaserz, Germ. Antim. mineraliz. gris. radiatum, Werner. Its color is light steel-gray, passing into a blackish gray, azure blue, golden yellow, and other splendid iridescent tints. It occurs disseminated, or in glandular mamillated and stalactitic masses or crystallised. The primitive form of its crystals has not yet been ascertained. Haüy has shown that they are most easily and neatly divisible in one direction only, parallel to their axes; other natural joints are, however, discernible by the varying reflection of light from these surfaces when held before a candle. The only crystalline form that has hitherto been determined, is a compressed hexahedral prism, terminated by obtuse tetrahedral pyramids with trapezoidal surfaces (antimoine sulphuré sexoctonal of Haüy). Born also mentions specimens from Hungary and Norway, of truncated tetrahedral prisms. The surface of the crystals is generally marked longitudinally, with delicate striæ, and possesses much lustre. The internal lustre both of the amorphous and crystallised kinds is metallic and bright, or little shining. Its fracture is striated either broad or narrow, radiating, diverging, or implicated. When broken, it flies into irregular prismatic, or long granular fragments. Is soft and brittle. Specific gravity from 4.13 to 4.51. Its component parts, according to Bergman, are,

74 antimony,
26 sulphur.

100

2. The fourth species of the same naturalists are red antimony. Rothes spiessglaserz, Germ. Soufre doré natif strié, et Kermes mineral natif, Delisle. Antimoine hydrosulfuré, Haüy. Antimonium auripigmento mineralizatum, Cronstedt. Antimonium mineralizatum rubrum. Werner.

The color of red antimony is a deep crimson approaching to blood-red, sometimes, though seldom, clouded with iridescent blue. It occurs generally in minute short hair, or needle-form crystals, radiating or implicated; sometimes also it is found massive or disseminated. Its lustre is vitreous, little shining. Its fracture is fine, and irregularly diverging fibrous. It is opaque, brittle but somewhat elastic: sp. gr. 4. to 4.7.

The V. species of the same naturalists are, white antimony. Muriated antimony, Kirwan. Weiss spiessglaserz, spiessglanzspath, Germ. Muriate d'antimoine, Born. Antimoine oxydé, Haüy. Antimonium mineralizatum album, Werner.

The color of white antimony passes from snow-white through grayish and yellowish white into ash gray. It is seldom found massive, often radiating like zeolite, but generally crystallised in small and long quadrilateral prisms or rectangular tables, which are accumulated together in bundles or cells. The surface of the crystals is plain, or longitudinally striated, and bright shining or specular. Internally this mineral is much shining, or shining with a vitreous lustre passing into pearly. Fracture straight foliated. It flies, when broken, into irregular, not particularly sharp-cornered, fragments. Is translucid, soft, brittle, and heavy.

In whole crystals it decrepitates before the blowpipe; but when powdered, it melts quietly and without difficulty, giving out a white smoke, and by degrees totally evaporates. Between two coals it is reducible to the metallic state.

From the analysis of Klaproth, it seems to consist of antimony and muriatic acid; but the acicular variety from Dauphiné afforded Vauquelin,

86 oxide of antimony,
3 oxide of iron and oxide of antimony,
8 silex,
3 loss.

100

This beautiful, but uncommonly rare fossil, was first discovered in 1782 by Mongez the younger at Allemont in Dauphiné, mixed with native antimony; afterwards, in 1787, by Rössler at Przibram on the surface of galena: it occurs at Malazka in Hungary, with the red and sulphurated antimony.

Native antimony is a mineral of very rare occurrence; it was first found in 1748 by Schwab, in the silver mines of Sahla in Sweden, with a gangue of calcareous spar; and has since been detected by Sage embedded in quartz in the mines of Allemont in Dauphiné.

All the antimonial ores are easily reducible before the blowpipe on charcoal; and by a continuation of the heat they exhale a dense smoke of a white or yellowish color, with little or no arsenical odor, and deposit yellowish flowers on white needle-form crystals, on the surface of the charcoal. A more certain method of ascertaining the presence of this metal is to reduce 200 grains of the ore to a fine powder, and to digest

it in a moderately diluted nitro-muriatic acid, in which the nitrous is not more than one-third of the muriatic part. After this process has been continued an hour, the clear liquor is to be decanted, and reduced by evaporation to about half its quantity, and then poured into a vessel of distilled water. A copious white precipitate of antimonial oxide immediately takes place, which when edulcorated, and mixed with an equal weight of crude tartar, is to be put into a small lined crucible, fitted with a cover, and by a moderate red heat the oxide will be reduced into a metallic button. The pure metal was called regulus of antimony; but in the reformed nomenclature, simple antimony, and is obtained from the native sulphuret, consisting, according to Bergman, of antimony and sulphur, in the proportions of seventy-four of the former to twenty-six of the latter. Numerous methods have been proposed for the separation of the metal, which have been arranged under three heads—I. Reduction by roasting. II. Reduction by scorification; and III. Reduction by dry parting, or precipitation. The following are the substances which have been found mixed with antimony: viz. iron, silver, lead, copper, arsenic, sulphur, silex and alumen, the two last composing the stony gangue, which cannot always be separated previous to analysis. Native antimony was examined by Klaproth, who on 100 grains of the pulverised mineral poured strong nitric acid, which attracted it with vehemence, and converted into an oxide, which, being diluted with water and precipitated, he then filtered. The clear liquid was treated with muriatic acid, which threw down the silver present in the state of muriate, equivalent to one grain of the previous metal. Prussiate of potash now indicated one quarter of a grain of iron. The oxide of antimony was now dissolved in muriatic acid, the solution diluted with water, a piece of zinc being introduced precipitated ninety-eight grains of metallic antimony. Hence it appeared that 100 grains of native antimony from Andreasberg consisted of metallic antimony 98, silver 1, iron 0.25, which equalled = 99.25.

The same philosopher digested 100 grains of fibrous red antimonial ore with muriatic acid, mixed with a few drops of the nitrous in a long-necked matrass. There was a gray residuum of 1½ grains of sulphur. The antimony contained in the solution was precipitated in a state of white oxide by diluting it with water, and the small portion yet remaining by means of potash. The oxide redissolved in muriatic, and the solution was diluted with six times its quantity of water, and again with as large a portion of the same solvent as was needful to redissolve that portion of the oxide which the affused water had precipitated. After the dilute solution had in this manner been again rendered clear, the ingredient antimony was reproduced as metallic antimony by immersing polished iron in the liquor, and when collected, edulcorated, and dried, supplied 67½ grains. From the above result, and Thenard's statement of the constitution of oxide, this chemist inferred that the mineral contained of metallic antimony 67.5, of oxygen 10.8, of sulphur 19.7. If the pulverised sulphuret of antimony be acted upon by nitric acid with heat and water, he afterwards added, a precipitate will fall, consisting of oxide of antimony, with sulphur and sulphate of lead. Sulphate of silver will remain in the liquid, but muriate of soda, if the solution be hot and a little dilute, will throw down the silver without affecting the lead, which may be precipitated by sulphate of soda, or by hydrosulphuret of ammonia. The sulphuric acid resulting from acidification of the sulphur, may be ascertained by muriate of barytes, and the iron by ferro-prussiate of potash. If on the first precipitate by water the muriatic acid be digested, the oxide of antimony will be taken up, and may be renewed in the metallic state by immersing zinc or iron in the muriatic solution; and sulphur may be separated from sulphate of lead by ustulation. The best method of obtaining metallic antimony from the sulphuret is by igniting it after ustulation with half its weight of crude tartar, when the metal will be found at the bottom of the crucible; or the ustulated oxide mixed with oil, fat, and powdered charcoal, may be ignited till drops of the metal begin to appear, when it will be proper to inject nitre equal to one-sixteenth of the weight of the oxide; or we may form a martial regulus of antimony by adding sixteen ounces of the sulphuret to six ounces of iron nails, ignited to whiteness in a crucible. When the whole are in fusion, inject gradually two ounces of pulverised nitre, cover the crucible, urge the heat, and seven or eight ounces of regulus will be found lying at the bottom, which may be further purified by a repetition of the process.

Professor Proust differs from Bergman, and makes the sulphuret contain 26 per cent. of sulphur. He heated 100 parts of antimony and 100 parts of sulphur in a glass retort, till the whole was well fused and the excess of sulphur expelled. The sulphuret remaining was 135. Berzelius makes it 100 antimony and 37.25 sulphur. Others 30, 33, 35 to 100. The proportion given by the equivalent ratio is 100 + 36.5. The specific gravity of antimony, according to Brisson, is about 6.7021, and, according to Bergman, 6.86. The white fumes which rise on its oxidisation by heat, and which may afterward be volatilised a second time, or fused into a hyacinthine glass, were formerly called argentine flowers of regulus of antimony. In closed vessels the antimony rises totally without decomposition. Its oxides are a little soluble in water; and in this respect they resemble the oxide of arsenic, by an approach toward the acid state. There are three, and probably four, combinations of antimony and oxygen. 1. The protoxide of Berzelius is a blackish-gray powder, obtained from a mixture of powder of antimony and water, at the positive pole of a voltaic circuit. By heat this oxide rapidly absorbs oxygen, and is converted into the tritoxide. According to Berzelius it consists of 100 of metal, and 4 6 oxygen. 2. The deutoxide may be obtained by digesting the metal in powder in muriatic acid and pouring the solution into water of potash. Wash and dry the precipitate. It is a powder of a dirty white color, which melts at a mode

rate red heat, and crystallises as it cools. According to Berzelius it consists of 84.3 metal + 15.7 oxygen. 3. The tritoxide, or antimonious acid, is the immediate product of the combustion of the metal, called, from its fine white color, the argentine flowers of antimony. It may also be formed by digesting hot nitric acid on antimony. When fused with one-fourth of antimony, the whole becomes deutoxide. It forms the salts called antimonites with the different bases. According to Berzelius, the tritoxide consists of about 80 metal + 20 oxygen. 4. The peroxide, or antimonic acid, is formed when the metal in powder is ignited with six times its weight of nitre in a silver crucible. The excess of potash and nitre being afterwards separated by hot water, the antimoniate of potash is decomposed by muriatic acid, and the insoluble antimonic acid of a straw-color obtained. Nitro-muriatic acid likewise converts the metal into the peroxide. Though insoluble in water, it reddens the vegetable blues, and does not combine with acids. At a red heat oxygen is disengaged, and antimonious acid results. Berzelius infers its composition to be 73.5 metal + 26.5 oxygen. It is difficult to reconcile the above three portions of oxygen to one prime equivalent for antimony. The number 11 gives the best approximation to Berzelius's analysis. We shall then have the

	Metal.	Oxy.	In 100 parts.	
Protoxide . . .	11	1	91.$\frac{2}{3}$	8.$\frac{1}{3}$
Deutoxide . . .	11	2	84.6	15.4
Tritoxide . . .	11	3	78.6	21.4
Peroxide . . .	11	4	73.4	26.6

The second and fourth numbers agree with experiment; the first oxide is too imperfectly known to enter into any minutiæ; and the third number, though it indicates a little more oxygen than Berzelius assigns, gives less than Proust. Chlorine gas and antimony combine with combustion, and a bichloride results. This was formerly prepared by distilling a mixture of two parts of corrosive sublimate with one of antimony. The substance which came over having a fatty consistence, was called butter of antimony, and is frequently crystallised in four-sided prisms. It is fusible and volatile at a moderate heat; and is resolved by water into the white oxide and muriatic acid. It is eminently corrosive, like the bichloride of mercury, and consists of 45.7 chlorine + 54.3 antimony, according to Dr. John Davy's analysis, when the composition of the sulphuret is corrected by its recent exact analysis by Berzelius. But 11 antimony + 2 primes chlorine = 9.0, give the proportion per cent. of 44.1 + 55.5; a good coincidence, if we consider the circuitous process of Dr. Davy's analysis. For making butter of antimony, three parts of corrosive sublimate, and one of metallic antimony, are the equivalent proportions. Iodine and antimony combine by heat into a solid iodide of a dark red color. The phosphuret of this metal is obtained by fusing it with solid phosphoric acid, and is a white semicrystalline substance. The only important alloys of antimony are those of lead and tin; the former constitutes type metal, and contains about one-sixteenth of antimony; the latter is employed for making the plates on which music is engraved. The salts of antimony are of two different orders: in the first, the deutoxide acts the part of a salifiable base; in the second, the tritoxide and peroxide act the part of acids, neutralising the alkaline and other bases, to constitute the antimonites and antimoniates. The only important combination of the first order is the triple salt called tartrate of potash and antimony, or tartar emetic, which, by M. Gay Lussac, would be styled cream-tartrate of antimony. It is a valuable and powerful medicine; but, in an undue dose, is capable of acting as a poison.

The composition of this salt, according to M. Thenard, is 35.4 acid, 39.6 oxide, 16.7 potash, and 8.2 water. The presence of the latter ingredient is obvious, from the undisputed phenomenon of efflorescence. If we adopt the views of M. Gay Lussac, this salt may be a compound of a prime equivalent of tartar = 23.825, with a prime equivalent of deutoxide of antimony = 13. On this hypothesis we should have the following proportions:

2	prime acid . .	=	16.75	45.4
1	prime potash .	=	5.95	16.2
1	prime water . .	=	1.125	3.1
1	oxide of antimony	=	12.00	35.3
			36.825	100.0

The deutoxide seems to have the property of combining with sulphur in various proportions. To this species of compound must be referred the liver of antimony, glass of antimony, and *crocus metallorum* of the ancient apothecaries. Sulphuretted hydrogen forms, with the deutoxide of antimony, a compound which possessed at one time great celebrity in medicine, and of which a modification has lately been introduced into the art of calico printing. The compounds formed by the antimonious and antimonic acids have not yet been applied to any important use.

ANTINE (Maur François d'), a Benedictine monk, was born at Gourieux, in the diocese of Liege, in 1688. He published the first five volumes of Du Cange's Glossary in 1736; besides which he was the author of a work entitled the Art of Verifying Dates, 4to, 1750; printed again in folio, 1770. He died in 1746.

ANTINOEIA, in antiquity, annual sacrifices, and quinquennial games in memory of Antinous the Bithynian, instituted at the command of Adrian, to be held at Mantinea in Arcadia. See Antinous.

ANTINOMASIA, a figure in rhetoric, where an appellation is used for a proper name.

ANTINOMIANS; *αντι*, against, and *νομος*, the law; in ecclesiastical history, those who are supposed to supersede the use and obligation of the moral law by their mode of stating the gospel. The term was first applied by Luther in 1538 to John Agricola, a doctor of some eminence among the reformed, and his followers, who are accused of having pushed the Lutheran doctrine of justi-

fication by faith to this extreme. Not only were good works according to their system considered unnecessary to salvation, but the attempting of them was detrimental to it: and they were never to be preached or enforced from the law, but only from the gospel; the former being wholly abrogated as a rule of life. Luther strongly inveighed against this doctrine; and Agricola is said by some writers to have recanted his opinions; by others, to have complained that he was wholly misrepresented. Be this as it may, various shades of these opinions have been professed among small numbers of Protestants since; and the term itself has been used extensively as a mark of opprobrium where the sentiments have never obtained. It appears to rank among those terms of polemical divinity, from whose entire extinction the sober student of controverted questions would suffer no loss, as it has been far more frequently used to affix to persons those consequences of their opinions which they never draw than for any other purpose. After Agricola, Amsdorf, in the following century, fell under similar imputations with the above. See AMSDORFIANS. In England, real Antinomianism would seem to have disgraced the profession of religion under the commonwealth; and Dr. Crisp, a writer of the seventeenth century, whose works are edited by Dr. Gill, has been considered, with the exception perhaps of some living authors, the most decided Antinomian writer of modern times. Bishop Bull, one of the earliest opponents of this system, defines it thus: 'That the faith whereby we are justified is nothing else but a recumbence or reliance upon Christ; or, which is a worse definition, that it is only a firm belief and persuasion that our sins are already pardoned, and we already justified; and, consequently, that the justification spoken of in Scripture is nothing else but the sense and knowledge of our justification as decreed from eternity: that Christ obeyed the law and suffered in our persons, and that his righteousness is formally ours, and consequently that there is no necessity of any righteousness in ourselves in order to our salvation: that the moral law, though Christ himself hath taken the pains to explain and press it on us, concerns not us Christians, as a law obliging us sub periculo animæ, under penalty of damnation; but is only a contrivance to frighten sinners, to convince them of their sins, and to show them their impotence and weakness: that we are to work, not for life but from life, as they phrase it; and, consequently, that all our good works are, after a sort, works of supererogation, to which no necessity obligeth us, but only gratitude freely inclines us.' The men that taught these sad propositions were called Antinomians.

This is a system into which it would easily be seen that the disciples of Calvin are at least very liable to fall. It is remarkable, however, that an alarm respecting some modern tendencies to Antinomianism has been sounded more loudly from this sect than any other. An eloquent writer of Calvinistic principles, who would do honor to any sect, the Rev. Robert Hall of Leicester, having been reproved for using the term conditions respecting our salvation, thus replies: 'When the term conditions of salvation, or words of similar import, are employed, he wishes it once for all to be clearly understood, that he utterly disclaims the notion of meritorious conditions, and that he intends by that term only what is necessary in the established order of means, a sine quâ non, that without which another thing cannot take place. When thus defined, to deny there are conditions of salvation is not to approach to Antinomianism merely, it is to fall into the gulf. It is nothing less than a repeal of all the sanctions of revelation, of all the principles of moral government. Let the idea of conditional salvation, in the sense already explained, be steadily rejected along with the term, and the patrons of the worst of heresies will have nothing further to demand. That repentance, faith, and their fruits in a holy life, supposing life to be continued, are essential pre-requisites to eternal happiness, is a doctrine inscribed as with a sun-beam in every page of revelation; the author is at a loss to conceive on what principle, or for what reason, dangerous concessions are due to Antinomianism—that thick-skinned monster of the ooze and the mire, which no weapon can pierce, no discipline can tame. Danger is to be repelled by intrepid resistance, by stern defiance—not by compliances and concessions: it is to be opposed, if opposed successfully, by a return to the wholesome dialect of purer times. Such is the intimate alliance betwixt words and things, that the solicitude with which the term condition, and others of similar import, have been avoided by some excellent men, has contributed more than a little to the growth of this wide-spreading pestilence. As almost every age of the church is marked by its appropriate visitation of error, so, little penetration is requisite to perceive that Antinomianism is the epidemic malady of the present, and that it is an evil of gigantic size, and deadly malignity. It is qualified for mischief by the very properties which might seem to render it merely an object of contempt—its vulgarity of conception, its paucity of ideas, its determined hostility to taste, science, and letters. It includes within a compass which every head can contain, and every tongue can utter, a system which cancels every moral tie, consigns the whole human race to the extremes of presumption or despair, erects religion on the ruins of morality, and imparts to the dregs of stupidity all the powers of the most active poison. The author will ever feel himself honored by whatever censure he may incur through his determined opposition to such a system.'—As far as there is any reality in the danger of which this author speaks, we know of nothing better calculated to meet it than his own able reasoning, except the diligent and impartial study of the whole of God's revealed will.

ANTINO'MY, *αντινομια*; from *αντι*, and *νομος*, a law against; the opposition of one law to another, or opposition to an express law, by disobedience or by a directly contrary practice.

If he once will'd adultery should be sinful, and to be punisht with death, all his omnipotence will not allow him to will the allowance that his holiest people might, as it were, by his own *antinomie*, or coun-

ter-statute, live unreproved in the same fact, as he himself esteem'd it according to our common explainers. *Milton's Doct. and Dis. of Divorce.*

For humility, poverty, meanness, and wretchedness are direct *antinomies* to the lusts of the flesh, the lusts of the eyes, and the pride of life.

Taylor's Great Exampler, p. 50.

Antinomies are almost unavoidable in such variety of opinions and answers. *Baker.*

ANTINOUS, the favourite of the emperor Adrian, born at Claudiopolis in Bithynia. There never was a more boundless and extravagant passion than he entertained for this youth. After his death, Adrian ordered divine honors to be paid to him, and named a city after him.

ANTINOUS, in astronomy, a part of the constellation Aquila.

ANTINOUS DI BELVIDERE, in sculpture, a beautiful statue, formerly in the museum at Paris, restored at the peace to its situation in the Belvidere Palace at Rome. It is by some called a Mercury.

ANTIO, a promontory in the pope's territories, in the middle division of Italy, so named from the ancient city of Antium. It has a fortified tower, and a convenient harbour was lately built near it.

ANTIOCH, *Αντιοχεια*, a city of Syria, lon. 35° 17′ E., and lat. 36° 6′ N.; situated in the present province of Sourne in Asiatic Turkey. This city was originally founded by Seleucus Nicator, founder of the Syro-Macedonian empire, of which it became the capital, on the south bank of the Orontes, in this place about fifty yards wide, and about fifteen or twenty miles from the shores of the Mediterranean. It was reckoned about 700 miles from Alexandria and Egypt. This is the town mentioned in the Bible; and according to St. Jerome was formerly called Riblah, Acts xi. Hieron. in Ezek. xlvii. The Turks call it Antaki or Antakil. This city was founded by Antigonus, who succeeded Alexander in Syria; and it was called Antigonia by him. But Seleucus, after vanquishing Antigonus, altered the situation as not being strong enough for a capital; and with the materials of the town built another city which he named Antiochia, after his father. It was long celebrated as one of the first cities of the east: it was the residence of the Macedonian kings of Syria, and subsequently of the Roman governors, after the Romans had succeeded in extending their power to distant provinces. It is frequently mentioned by the authors of the books of the New Testament. Antioch was also known by the name of Tetrapolis, being divided into four cities, each surrounded by its proper wall, besides a common one which enclosed them all. The first of these was the city built by Seleucus Nicator; the second by those who flocked thither on its being made the capital of the Syro-Macedonian empire; the third by Seleucus Callinichus; and the fourth by Antiochus Epiphanes. About four or five miles distant stood a place called Daphne, which was nevertheless reckoned a suburb of Antioch. Here Seleucus planted a grove, and in the middle of it built a temple which he consecrated to Apollo and Diana, making the whole an asylum. To this place the inhabitants of Antioch resorted for their pleasures and diversions; whereby it became at last so infamous, that 'to live after the manner of Daphne,' was used as a proverb to express the most voluptuous and dissolute way of living. So remarkable was the Daphne of old that the metropolis itself was distinguished by it and called Antioch, near Daphne.

This place has been subject to numerous calamities. In the year A. A. C. 145, the people being disaffected to the person and government of Demetrius their king, that prince obtained from the Jews assistance under Jonathan one of the Maccabees, killed 10,000 inhabitants, and set fire to the city.

About the year 115, in the reign of Trajan, it was almost entirely ruined by one of the most dreadful earthquakes mentioned in history. Trajan himself happened to be there at that time, on his return from an expedition against the Parthians, so that the city was then full of troops, and strangers come from all quarters. The earthquake was preceded by violent claps of thunder, unusual winds, and a dreadful noise under ground. The shock was so terrible that great numbers of houses were overturned, and others tossed like a ship at sea. Those who happened to be in their houses were for the most part buried under their ruins; those who were walking in the streets or in the squares were by the violence of the shocks dashed against each other, and most of them either killed or dangerously wounded. This earthquake continued, with some small intermission, for many days and nights, so that vast numbers perished. The most violent shock, according to the acts of St. Ignatius, was on a Sunday, December 23. By this Trajan was much hurt, but escaped through a window. Dio Cassius pretends that he was taken out of the window, by one who exceeded the human size in tallness. The same historian adds that mount Lison, which stood at a small distance from the city, bowed its head and threatened to fall upon it; that other mountains fell; that new rivers appeared; and others, that had flowed before, forsook their course and vanished. When the earthquake ceased a woman was heard crying under the ruins, which being immediately removed she was found with a living child in her arms. Search was made for others, but none were found alive except one child which continued sucking its dead mother. Trajan, who was an eye-witness of this terrible calamity, contributed towards the re-establishment of Antioch in its ancient splendor. In 155 it was almost entirely burnt by accidental fire; when it was again restored by Antoninus Pius. In 176 or 177, the inhabitants having sided with Cassius, the above-mentioned Roman general who had revolted from M. Aurelius, that emperor published a severe edict against them, deprived them of all their privileges, suppressed their public assemblies, and took from them the shows and spectacles, to which they were greatly addicted; although his anger was soon appeased. In 194, having sided with Niger against Severus, the latter deprived them of all their privileges, and subjected Antioch, as a mere village, to Laodicea; but, however, pardoned them next year at the entreaty of his eldest son, then a child.

When the Roman empire began to decline Antioch became the bone of contention between them and the eastern nations; and accordingly on the breaking out of a Persian war it always suffered. In 242 it was taken and plundered by Sapor; and eighteen years after underwent the same misfortune in the time of Valerian; and after the defeat and captivity of Valerian, being taken by the Persian monarch a third time, he not only plundered it, but levelled all the public buildings with the ground. About the division of the Roman empire by Constantine in 331, it was afflicted with a dreadful famine. In the year 347 Constanstine II. at an immense expense, caused an harbour to be made at Seleucia for the convenience of Antioch. When the emperor Julian set out on his expedition against the Persians he made a long stay at Antioch; during which time many of the Roman provinces were afflicted with a famine, but which raged more violently in Antioch than in any other place. The ecclesiastical writers of those times say that this famine followed Julian from place to place; and, as he continued longer at Antioch than any other city, it raged there more violently. Julian fixed the price of corn, by which means the famine was greatly increased, the merchants conveying their corn privately to other places, so that this metropolis was reduced to a most deplorable situation. In 381, in the reign of Theodosius the Great, Antioch was again visited by a famine accompanied with a grievous plague: the latter soon ceased; but, the famine still continuing, the bishop, Libanius, applied to Icarius count of the east, requesting him by some means or other to relieve the poor who had flocked to all parts of the metropolis, and were daily perishing in great numbers; but to this Icarius gave no other answer than that they were abhorred, and justly punished by the gods. This inhuman answer raised great disturbances, which, however, were terminated without bloodshed. In 387 Theodosius, to celebrate the fifth year of the reign of his son Arcadius and the tenth of his own, laid an extraordinary tax upon the people. The people of Antioch crowded to the house of Flavianus their bishop to implore his protection. Being unable to find him they returned to the forum, and would have torn the governor in pieces had not the officers who attended him kept back with great difficulty the enraged multitude till he made his escape. Upon this they broke some of the emperor's statues and dragged others through the city, but were dispersed by a body of archers. The governor proceeded against the offenders with the utmost cruelty, exposing some to wild beasts in the theatre, and burning others alive. He did not spare even the children who had insulted the emperor's statues; and caused several persons to be executed who had only been spectators of the disorder. In the mean time a report was spread that a body of troops was at hand, with orders to plunder the city and put all to the sword without distinction of sex or age; upon which the citizens abandoned their dwellings in the utmost terror and confusion, retiring to the neighbouring mountains with their wives and families. As the report proved groundless some of them returned; but the greater part, dreading the cruelty of the governer and the displeasure of the emperor, continued in their retreats. To those who returned St. Chrysostom preached some homilies, which have reached our times and are greatly admired, and which are said by St. Chrysostom himself, as well as some contemporary writers, to have had a considerable effect in reforming the lives of this licentious and dissolute people. On hearing the news of this tumult Theodosius commanded the city to be destroyed, and its inhabitants to be put to the sword without distinction; but this order was revoked: the judges, however, punished the offenders with such severity, and condemned such numbers, that the city was thrown into the utmost consternation. On this occasion St. Chrysostom and the hermits drew up a memorial to the emperor in favor of the citizens, and being joined by Flavianus obtained a general pardon and had the city restored to all its former privileges. In 458 Antioch was almost entirely ruined by an earthquake, which happened on the 14th of September; scarcely a single house being left standing in the most beautiful quarter of the city. A similar misfortune happened in 525, during the reign of the emperor Justin; and fifteen years after, being taken by Cosrhoes king of Persia, that haughty tyrant gave it up to his soldiers, who put all they met to the sword: the king himself seized on all the gold and silver vessels belonging to the great church, and caused all the valuable statues, pictures, &c. to be taken down and conveyed to Persia, while his soldiers carried off every thing else. The city being thus completely plundered Cosrhoes ordered his men to set fire to it; which was accordingly done so effectually that none of the buildings even without the walls escaped. Such of the inhabitants as escaped slaughter were carried into Persia, and sold as slaves. Notwithstanding such great and repeated calamities the city of Antioch soon recovered its ancient splendor; but in 587 underwent its usual fate, being almost entirely reduced by a earthquake, by which 30,000 persons lost their lives. In 634 it fell into the hands of the Saracens, who kept possession of it till the year 83 when it was again annexed to the Roman empire, and continued so till it was taken by the Turks. The crusaders, who conquered this part of Syria about the close of the eleventh century constituted a principality under the name of Antioch in 1098. It was first ruled by Boemond prince of Tarento, who was taken by the Turks 1101. Tancred was invited to the provisional government and died the following year. Boemond was liberated in 1103. In 1148 the sultan Noureddin occupied the whole principality of Antioch, except the metropolis; and his troops in 1160 took Boemond III. prisoner, who was detained in captivity at Aleppo till 1175, when through the intercession of his brother-in-law Manuel the Greek emperor, he was liberated and died in 1201. Boemond was created a knight by Louis XI. of France at Jaffa. In 1 he espoused the cause of the Venetians against the Genoese, which led to the expulsion of the Christians from the Holy Land. The city

Antioch was taken by Bendocdar or Bibars, sultan of Babylon, in 1268, which event put an end to the principality. Antioch was afterwards incorporated with the Turkish empire. A great part of the city was thrown down by an earthquake in 1759, and again in 1822.

Antioch is no more than a ruinous town; the houses are mean and low, and the general appearance melancholy. The steep banks of the Orontes are covered with numerous plantations; but the soil of the plain though excellent is uncultivated. The city stands about 600 yards distant from the base of a mountain, and is surrounded by walls enclosing a space of more than a mile and a half in diameter, including hills with ancient fortifications. They consist of stone in a decaying state, flanked at unequal distances with towers. The ancient gate leading to Aleppo is magnificent but much decayed; and of the original city a small portion only, with some kitchen gardens, is contained within the present enclosure. The streets are narrow with very elevated footpaths on each side, and the houses are built with stone and covered with tiles, which is unusual in Syria. The city is governed by a mohassel, dependent on the pacha of Aleppo, but appointed by the porte. The population is estimated at 3000 Christians, 15,000 Mahommedans, and 150 Jews. This city is the residence of a patriarch of the Greek church. It is pretended that St. Peter established the patriarchal see in the year 38; and that after him the bishops, who have successively held it, received the title of patriarchs of the east. A council was held here in 56 A. D. in which the apostles are supposed to have regulated the discipline of the church. It has been the seat of several councils since.

ANTIOCHE, Pertuis d', a strait on the west coast of France, which separates the island of Oleron from those of Rhe and Aix, and is defended by Fort Samblanceau. It was here that the Bellerophon lay till Buonaparte surrendered himself to the British on the 15th July, 1815.

ANTIOCHETTA, a town of Turkey in Asia, in Caramania, with a bishop's see, over against the island of Cyprus. Long. 32° 15′ E., lat. 36° 42′. N.

ANTIOCHIA, in ancient geography, the name of, viz. 1. a town of Assyria, situated between the rivers Tigris and Tornadodas: 2. in Caria, on the Meander; called also Anthopolis, Athymbra, and Nyssa or Nysa by Stephanus; but Strabo says, that Nysa was near Tralles: 3. in Cilicia Trachea, on mount Cragus: 4. the capital of Syria, distinguished from the cities of the same name either by its situation on the Orontes, by which it was divided, or by its proximity to Daphne, hence called Epidaphnes: 5. a town of Comagene, on the Euphrates: 6. in Lydia, called also Tralles by Pliny: 7. of Margiana on the river Margus, named from Antiochus son of Seleucus, who rebuilt it, and walled it round, being before called Alexandria, from Alexander; in compass seventy stadia; either Orodes carried the Romans after the defeat of Crassus: 8. in Mesopotamia, on the lake Chalcitis, the old name of Edessa: 9. on the river Mygdonius in Mesopotamia, situated at the foot of mount Masius, and the same with Nisibis. It was the bulwark and frontier town of the Romans against the Parthians and Persians, till given up to the Persians by Jovian, by an ignominious peace: 10. the capital of Pisidia, a Roman colony with the appellation Cæsarea: 11. at mount Taurus, mentioned by Ptolemy, but by no other author.

ANTIOCHIAN Academy, or Sect, a name given to the fifth academy, or branch of academies. It took this denomination from its having been founded by Antiochus, the philosopher. The Antiochian academy succeeded the Philonian. As to doctrine the philosophers of this sect appear to have restored that of the ancient academy, except that in the article of the criterion of truth, Antiochus was really a stoic, and only nominally an academic.

Antiochian Epocha, a method of computing time from the proclamation of liberty granted the city of Antioch, about the time of the battle of Pharsalia.

ANTIOCHUS of Ascalon, a celebrated philosopher, the disciple of Philo of Larissa, the master of Cicero, and the friend of Lucullus and Brutus. He was founder of a fifth academy; but, instead of attacking other sects, he endeavoured to reconcile them together, particularly the sect of the stoics with that of the ancient academy.

Antiochus, the name of various kings of Syria. See that article.

ANTIOCO, St. the Euosis of the ancients, an island in the Mediterranean, about fourteen miles in length, and from two to four in breadth, lying at the distance of two miles from the south-west coast of Sardinia. It is thinly peopled, but has good pastures, and a fine breed of horses, many of which run wild in the fields and woods.

ANTIOPE, in fabulous history: 1. The wife of Lycus king of Thebes, who, being deflowered by Jupiter in the form of a satyr, brought forth Amphion and Zethus. 2. A queen of the Amazons, who, with the assistance of the Scythians, invaded Athens, but was vanquished by Theseus, who married her.

ANTIOQUIA, or St. Fe de Antioquia, a town in the new department of Cauca, Columbia. It is seated on the banks of the river Cauca, about 200 miles N. N. W. of St. Fe de Bogota.

ANTIPÆDOBAPTISTS; from *αντι*, against, *παις*, *παιδος*, child, and *βαπτιζω*, baptize, whence *βαπτιστης*; a denomination given to those who object to the baptism of infants; because they say infants are incapable of being instructed, and of making that profession of faith which entitles them to this ordinance and an admission into church communion. See Baptists.

ANTIPAPINUS, or Antipapinianus, *αντιπαπινιανος*. A title given by the Greek lawyers to the fourth part of the Digest, including four books, beginning with the title De Pignoribus. It was so denominated, as being in opposition to Papinian, because it served in the schools in lieu of the books of that lawyer, pursuant to an edict of Justinian.

ANTIPARALLELS, in geometry, are those lines joining the two legs of an angle, which make the same angles like parallel lines, but in

opposite directions. M. Leibnitz, however, calls those lines antiparallels, which cut two parallels so that the outward angle being added to the inward one, the sum may be equal to a right angle.

ANTIPARASIASIS, in rhetoric, a figure by which one granting something to his opponent, thereby turns it to deny more strongly.

ANTIPARASTASIS; from *αντι*, and *παρασασις*, of *παριστημι*, I exhibit; in rhetoric, a reply made to an opponent by allowing part of his argument, and denying the rest, e. g. 'you may paint whatever you please, provided the public suffer no prejudice from it, but you must not if it does.'

ANTIPAROS, an island in the Archipelago, opposite to Paros, in a western direction, and from which it is separated by a strait about seven miles over. It is the Olearos, or Oliaros, mentioned by Strabo, Pliny, Virgil, Ovid, &c.; and was, according to Heraclides Ponticus, as quoted by Stephanus, first peopled by a Phœnician colony from Sidon.—According to Mr. Tournefort's account, is about sixteen miles in circumference, producing wine and cotton, with as much corn as is necessary for the maintenance of sixty or seventy families, who live together in a village at one end of the island. This island is remarkable for a subterraneous cavern or grotto, accounted one of the greatest natural curiosities in the world. It was first discovered in the last century by Magni an Italian traveller, who has given us the following account of it:—'Having been informed,' says he, 'by the natives of Paros, that in the little island of Antiparos, which lies about two miles from the former, of a gigantic statue that was to be seen at the mouth of a cavern in that place, it was resolved that we (the French consul and himself) should pay it a visit. In pursuance of this resolution, after we had landed on the island, and walked about four miles through the midst of beautiful plains and sloping woodlands, we at length came to a little hill, on the side of which yawned a most horrid cavern, that, with its gloom, at first struck us with terror, and almost repressed curiosity. Recovering the first surprise, however, we entered boldly; and had not proceeded above twenty paces when the supposed statue of the giant presented itself to our view. We quickly perceived, that what the ignorant natives had been terrified at as a giant, was nothing more than a sparry concretion, formed by the water dropping from the roof of the cave, and by degrees hardening into a figure that their fears had formed into a monster. Incited by this extraordinary appearance, we were induced to proceed still further in quest of new adventures in this subterranean abode. As we proceeded, new wonders offered themselves; the spars, formed into trees and shrubs, presented a kind of petrified grove; some white, some green, and all receding in due perspective. They struck us with the more amazement as we knew them to be mere productions of nature, who, hitherto in solitude had, in her playful moments, dressed the scene as if for her own amusement. But we had as yet seen but a few of the wonders of this place; and we were introduced as yet only into the portico of this amazing temple. In one corner of this half-illuminated recess there appeared an opening of about three feet wide, which seemed to lead to a place totally dark, and that one of the natives assured us contained nothing more than a reservoir of water. Upon this we tried, by throwing down some stones, which rumbling along the sides of the descent for some time, the sound seemed at last quashed in a bed of water. In order, however, to be more certain, we sent in a Levantine mariner, who, by the promise of a good reward, with a flambeau in his hand ventured into this narrow aperture. After continuing within it for about a quarter of an hour, he returned, carrying some beautiful pieces of white spar in his hand, which art could neither imitate nor equal. Upon being informed by him that the place was full of these beautiful incrustations, I ventured in once more with him, for about fifty paces, anxiously and cautiously descending by a steep and dangerous way. Finding, however, that we came to a precipice which led into a spacious amphitheatre, if I may so call it, still deeper than any other part, we returned; and being provided with a ladder, flambeaux, and other things to expedite our descent, our whole company, man by man, ventured into the same opening, and, descending one after another, we at last saw ourselves altogether in the most magnificent part of the cavern. Our candles being now all lighted up, and the whole place completely illuminated, never could the eye be presented with a more glittering or a more magnificent scene. The roof all hung with solid icicles transparent as glass, yet solid as marble. The eye could scarcely reach the lofty and noble ceiling; the sides were regularly formed with spars, and the whole presented the idea of a magnificent theatre, illuminated with an immense profusion of lights. The floor consisted of solid marble; and, in several places, magnificent columns, thrones, altars, and other objects, appeared as if nature had designed to mock the curiosities of art. Our voices, upon speaking or singing, were redoubled to an astonishing loudness; and, upon the firing of a gun, the noise and reverberations were almost deafening. In the midst of this grand amphitheatre rose a concretion of about fifteen feet high, that, in some measure, resembled an altar from which, taking the hint, we caused mass to be celebrated there. The beautiful columns that shot up round the altar, appeared like candlesticks; and many other natural objects represented the customary ornaments of this sacrament. Below even this spacious grotto there seemed another cavern, down which I ventured with my former mariner, and descended about fifty paces by means of a rope. I at last arrived at a small spot of level ground where the bottom appeared different from that of the amphitheatre, being composed of soft clay, yielding to the pressure, and in which I thrust a stick to about six feet deep. In this however, as above, numbers of the most beautiful crystals were formed, one of which particularly resembled a table. Upon our egress from this amazing cavern, we perceived a Greek inscription upon a rock at the mouth, but so obliterated by time that we could not read it:

seemed to import that one Antipater, in the time of Alexander, had come thither, but whether he penetrated into the depths of the cavern he does not think fit to inform us.' From this account Mr. Tournefort's differs somewhat. Mr. Magni mentions only one descent or precipice from the entry of the cave to the grotto, or most magnificent part. Mr. Tournefort says that there were many very dangerous precipices and rugged ways, through which they were obliged to pass, sometimes on their back and sometimes on their belly; but gives no particular account of his journey till he comes to the grand cavern. This indeed he describes very pompously; but as by it he evidently wants to support a favorite hypothesis, namely, the vegetation of stones, perhaps the particulars are not altogether to be depended upon. He informs us, that, at the entry into the cavern, he met with a Greek inscription almost defaced, containing a good number of proper names; and that there was a tradition among the inhabitants that these were the names of some who had conspired against Alexander the Great, and, having missed their aim, had taken refuge in this grotto. The most particular account of this famous grotto that has hitherto been published, appeared in the British Magazine, in a letter of Mr. Charles Saunders's, dated February 24th, 1756—1757. 'Its entrance lies in the side of a rock, about two miles from the sea-shore, and is a spacious and very large arch, formed of rough craggy rocks, overhung with brambles, and a great many climbing plants, that give it a gloominess which is very awful and agreeable. Our surgeon, myself, and four passengers, attended by six guides with lighted torches, entered this cavern about eight o'clock in the morning in the middle of August last. We had not gone twenty yards in this cavity, when we lost all sight of day-light; but, our guides going before us with lights, we entered into a low narrow kind of alley surrounded every way with stones, all glittering like diamonds by the light of our torches; the whole being covered and lined throughout with small crystals, which gave a thousand various colors by their different reflections. This alley grows lower and narrower as we goes on, till at length one can scarce get along

At the end of this passage we were each of us presented with a rope to tie about our middles: which when we had done, our guides led us to the brink of a most horrible precipice. The descent to this was quite steep, and the place all dark and gloomy. We could see nothing, in short, but one of our guides with torches, in a miserable dark place, at a vast distance below us. The dreadful depth of this place, and the horror of the descent through a miserable darkness into it, made me look back to the lane of diamonds, if I may so call it, through which we had just passed; for I could not but think I was leaving heaven to descend into the infernal regions. The hope of something fine at my journey's end, tempted me, however, to trust myself to the rope and my heels at the top, to let myself down. After I had hung two minutes dangling in this posture, not without much pain as well as terror, I found myself safe, however, at the bottom; and our friends soon followed the example. When we had congratulated here with one another on our safe descent; I was inquiring where the grotto, as they called it, was. Our guides, shaking their heads, told us, we had a great way to that yet; and led us forward about thirty yards under a roof of ragged rocks, in a scene of terrible darkness, and at a vast depth from the surface of the earth, to the brink of another precipice, much deeper and more terrible than the former. Two of the guides went down here with their torches first; and by their light we could see, that this passage was not so perpendicular indeed as the other, but lay in a very steep slant, with a very slippery rock for the bottom; vast pieces of rough rugged rock jutting out in many places on the right hand in the descent, and forcing the guides sometimes to climb over, sometimes to creep under, and sometimes to go round them; and on the left a thousand dark caverns, like so many monstrous wells, ready, if a foot should slip, to swallow them up for ever. We stood on the edge to see these people with their lights descend before us; and were amazed and terrified to see them continue descending till they seemed at a monstrous and most frightful depth. When they were at the bottom, however, they hallooed to us; and we, trembling and quaking, began to descend after them. We had not gone thirty feet down, when we came to a place where the rock was perfectly perpendicular; and a vast cavern seemed to open its mouth to swallow us up on one side, while a wall of rugged rock threatened to tear us to pieces on the other. I was quite disheartened at this terrible prospect, and declared I would go back; but our guides assured us that there was no danger; and the rest of the company resolving to see the bottom now they were come so far, I would not leave them: so on we went to a corner where there was placed an old slippery and rotten ladder, which hung down close to the rock; and down this, one after another, we at length all descended. When we had got to the bottom of this we found ourselves at the entrance of another passage, which was terrible indeed; but in this there was not wanting something of beauty. This was a wide and gradual descent; at the entrance of which one of our guides seated himself on his breech, and began to slide down, telling us we must do the same. We could discover by the light of his torch, that this passage was one of the noblest vaults in the world. It is about nine feet high, seven wide, and has for its bottom a fine green glossy marble. The walls and arch of the roof of this being as smooth and even in most places as if wrought by art, and made of a fine glistening red and white granite, supported here and there with a deep blood-red shining porphyry, made, with the reflection of the lights, an appearance not to be conceived. This passage is at least forty yards long; and of so steep a descent, that one has enough to do, when seated on one's breech, not to descend too quickly. Our guides, that we kept with us, could here keep on each side of us; and, what with the prodigious grandeur and beauty of the place, our easy travelling through it, and the diversion of our now and then running over one another whether we would or not; this was much the pleasantest part

of our journey. When we had entered this passage, I imagined we should at the bottom join the two guides we had first set down: but, alas, when we were got there, we found ourselves only at the mouth of another precipice, down which we descended by a second ladder not much better than the former. I could have admired this place also, would my terror have suffered me; but the dread of falling kept all my thoughts employed during my descent. I could not but observe, however, as my companions were coming down after me, that the wall, if I may so call it, which the ladder hung by, was one mass of blood-red marble covered with white sprigs of rock-crystal, as long as my finger, and making, with the glow of the purple from behind, one continued immense sheet of amethysts. From the foot of this ladder we slided on our bellies through another shallow vault of polished green and white marble, about twenty feet; and at the bottom of this joined our guides. Here we all got together once again, and drank some rum, to give us courage before we proceeded any farther. After this short refreshment, we proceeded by a strait, but somewhat slanting passage, of a rough, hard, and somewhat coarse stone, full of a thousand strange figures of snakes rolled round, and looking as if alive; but in reality as cold and hard as the rest of the stone, and nothing but some of the stone itself in that shape. We walked pretty easily along this descent for near 200 yards; where we saw two pillars seemingly made to support the roof from falling in: but in reality it was no such thing; for they were very brittle, and made of a fine glittering yellow marble. When we had passed these about 200 yards, we found ourselves at the brink of another very terrible precipice: but this our guides assured us was the last; and there being a very good ladder to go down by, we readily ventured. At the bottom of this steep wall, as I may call it, we found ourselves for some way upon plain even ground; but, after about forty yards walking, were presented by our guides with ropes again; which we fastened about our middles, though not to be swung down by, but only for fear of danger, as there are lakes and deep waters all the way from hence on the left hand. With this caution, however, we entered the last alley; and horrible work it was indeed to get through it. All was perfectly horrid and dismal here. The sides and roof of the passage were all of black stone; and the rocks in our way were in some places so steep, that we were forced to lie all along on our backs, and slide down; and so rough, that they cut our clothes, and bruised us miserably in passing. Over our heads there were nothing but ragged black rocks, some of them looking as if they were every moment ready to fall in upon us; and, on our left hand, the light of our guides' torches showed us continually the surfaces of dirty and miserable looking lakes of water. If I had heartily repented of my expedition often before, here I assure you I was all in a cold sweat, and fairly gave myself over for lost; heartily cursing all the travellers that had written of this place, that they had described it so as to tempt people to see it, and never told us of the horrors that lay in the way. In the midst of all these reflections, and in the very dismallest part of all the cavern, on a sudden we lost four of our six guides. What was my terror on this sight! The place was a thousand times darker and more terrible for want of their torches; and I expected no other but every moment to follow them into some of these lakes, into which I doubted not but they were fallen. The remaining two guides said all they could, indeed, to cheer us up; and told us we should see the other four again soon, and that we were near the end of our journey. I don't know what effect this might have upon the rest of my companions; but I assure you I believed no part of the speech but the last, which I expected every moment to find fulfilled in some pond or precipice. Our passage was by this time become very narrow, and we were obliged to crawl on all fours over rugged rocks; when in an instant, and in the midst of these melancholy apprehensions, I heard a little hissing noise, and saw myself in utter, and not to be described, darkness. Our guides called indeed cheerfully to us, and told us that they had accidentally dropped their torches into a puddle of water, but we should soon come to the rest of them, and they would light them again; and told us there was no danger, and we had nothing to do but to crawl forward. I cannot say but I was amazed at the courage of these people; who were in a place where, I thought, four of them had already perished, and from whence we could none of us ever escape; and determined to lie down and die where I was. Words cannot describe the horror, or the extreme darkness, of the place. One of our guides, however, perceiving that I did not advance, came up to me, and, clapping his hand firmly over my eyes, dragged me a few paces forward. While I was in this strange condition, expecting every moment death in a thousand shapes, and trembling to think what the guide meant by this rough proceeding, he lifted me at once over a great stone, set me down on my feet, and took his hand from before my eyes. What words can describe at that instant my astonishment and transport! Instead of darkness and despair, all was splendor and magnificence before me; our guides all appeared about us; the place was illuminated by fifty torches, and the guides all welcomed me into the grotto of Antiparos. The four that were first missing, I now found had only given us the slip, to get the torches lighted before we came; and the two had put out their lights on purpose, to make us enter out of utter darkness into this pavilion of splendor and glory. I am now come to the proper business of this letter; which was, to describe this grotto. But I must confess to you that words cannot do it. Of the amazing beauties of the place it is impossible for the most brilliant imagination to form a correct picture. The best account with which I can furnish you, however, pray accept of.

The people told us the depth of this place was 485 yards. The grotto, in which we now were, is a cavern of 120 yards wide, and 11 long, and seems about sixty yards high in most places. These measures differ something from the accounts travellers in general give us; but

you may depend upon them as exact, for I took them with my own hand. Imagine, then, an immense arch like this, almost all over lined with fine and bright crystallised white marble, and illuminated with fifty torches; and you will then have some faint idea of the place I had the pleasure to spend three hours in. This, however, is but a faint description of its beauties. The roof, which is a fine vaulted arch, is hung all over with icicles of white shining marble, some of them ten feet long, and as thick as one's middle at the root: and among these there hang 1000 festoons of leaves and flowers of the same substance; but so very glittering, that there is no bearing to look up at them. The sides of the arch are planted with seeming trees of the same white marble, rising in rows one above another, and often enclosing the points of the icicles. From these trees there are also hung festoons, tied as it were from one to another in vast quantities; and in some places among them there seem rivers of marble winding through them in a thousand meanders. All these things are only made in a long course of years from the dropping of water, but really look like trees and brooks turned to marble. The floor we trod upon was rough and uneven, with crystals of all colors growing irregularly out of it, red, blue, green, and some of a pale yellow. These were all shaped like pieces of saltpetre; but so hard, that they cut our shoes; among these, here and there, are placed icicles of the same white-shining marble with those above, and seeming to have fallen down from the roof and fixed there; only the big end of these is to the floor. To all these our guides had tied torches, two or three to a pillar, and kept continually beating them to make them burn bright. You must guess what a glare of splendor and beauty must be the effect of this illumination among such rocks and columns of marble. All round the lower part of the sides of the arch are a thousand white masses of marble in the shape of oak trees. Mr. Tournefort compares them to cauliflowers, but I should as soon compare them to toad-stools. In short, they are large enough to enclose, in many places, a piece of ground big enough for a bed-chamber. One of these chambers has a fair white curtain, whiter than satin, of the same marble, stretched all over the front of it. In this we all cut our names, and the date of the year, as a great many people have done before us. In a course of years afterwards, the stone blisters out like this white marble over these letters. Mr. Tournefort thinks the rock grows like oak or apple-trees for this reason; but I remember I saw some of the finest cockle and muscle shells in the rock thereabouts, that ever I saw in my life. I wonder whether he thinks they grow there too. Besides, if this rock grows so fast, the cavern ought to be all grown up by this time; and yet, according to his measures and mine, the cavern seems on the other hand to be turned larger since. Indeed, all that I can gather from his account of this glorious place is, that he had drank a bottle or two too much before he went down into it.'

ANTIPASCHA, in ecclesiastical writers, denotes the first Sunday after Easter. It is also called Dominica in albis.

ANTIPASIS, among physicians, revulsion.

ANTIPATER, a native of Macedon, a disciple of Aristotle, and a faithful minister to Philip and Alexander. He was a man of great abilities, and a lover of the sciences; but the following anecdotes say more for him than any pen could say at this date:—Philip coming rather late one day to the levee, said, 'I have slept sound this morning, but then I knew Antipater was waking.'—Some person having remarked to Alexander that all his officers of state wore purple except this prime minister, 'Yes, replied he, 'but Antipater is all purple within.' Alexander left the government of Macedon to Antipater while he was abroad; who by his prudent conduct kept all Greece in subjection. On the death of his master, in the division of territories, the European provinces were assigned to Antipater. Soon after the confederate states of Greece attacked him, but he subdued them and completely overturned their democratic forms of government, on which he was called the father of Greece. He died A. A. C. 318, aged eighty. Having chosen Polyperchon as his successor, his last advice to him was, never to allow a woman to meddle in state affairs.

ANTIPATER, a grandson of the preceding, and son of Cassander, by Thessalonice the sister of Alexander the Great; a monster, who murdered his mother with his own hand, because she favored his brother Alexander's claim to the crown; although she begged for her life, and showed him her breasts that had suckled him.

ANTIPATER, an Idumæan of illustrious birth, and possessed of great riches and abilities, taking advantage of the confusion into which the two brothers Hyrcanus and Aristobulus had plunged Judea by their contest for the office of high-priest, took such measures to gain Hyrcanus that office, and under his government to obtain the absolute direction of all affairs, while his great abilities and application to business made him so considerable, that he was honored as much as if he had been invested with the royal authority in form; but he was at last poisoned by a Jew named Malichus, forty-three years before the Christian æra. He left, among his other children, the famous Herod king of the Jews.

ANTIPATER (Cœlius), a Roman historian, who wrote a history of the Punic war, much valued by Cicero: the emperor Adrian preferred him to Sallust.

ANTIPATER of Sidon, a stoic philosopher and poet, commended by Cicero and Seneca, who flourished about the 171st olympiad. Several of his epigrams are extant in the Anthologia.

ANTIPATER, bishop of Bostra, in Arabia, about the end of the fifth century. He wrote an answer to Eusebius's defence of Origen.

ANTIPATHES, among the ancient naturalists, was used to express any stone or gem, which according to their superstitious ideas of the virtues of gems at that time, was supposed to have a power of resisting the force of enchantments. Pliny mentions a very valuable gem, called by the ancients antipathes for this very reason; and the black coral had the same name on the same account.

ANTIPATHES, a species of the gorgonia, in the order of zoophytes.

ANTIP'ATHY, ANTIPATHET'ICAL, ANTIPATHET'IC, ANTIP'ATHOUS. } *Αντι*, against, and *παθος*, feeling. Feeling opposed to that of another person; an interior sentiment of discordance, dislike.

Tyed upon the sledge, a papist and a protestant in front, two and two together, being two very disparate and *antipathetic* companions. *Icon Libell.*

No contraries hold more *antipathy*,
Than I and such a knave. *Shakspeare.*

Let no man weakly conceive, that just laws and true policy have any *antipathy*; for they are like the spirits and sinews, that one moves with the other. *Lord Bacon's Essays.*

FRED. What sublunary mischief can predominate
A wise man thus? or doth thy friendship play
(In this *antipathous* extreme) with mine,
Lest gladness suffocate me?
Beau. and Fletch. Four Plays in One.

The soil is fat and luxurious, and *antipathetical* to all venomous creatures. *Howell's Vocal Forest.*

To this perhaps might be justly attributed most of the sympathies and *antipathies* observable in men. *Locke.*

A man who talks with intrepidity of the monsters of the wilderness while they are out, will readily confess his *antipathy* to a mole, a weasel, or a frog. Thus he goes on without any reproach from his own reflections. *Johnson.*

There is one species of terror which those who are unwilling to suffer the reproach of cowardice have wisely dignified with the name of *antipathy*. *Id.*

ANTIPATHY, in physiology, is not used to signify such incompatibilities as are merely physical; but rather to express the aversion which an animated or sensitive being feels at the real or ideal presence of particular objects. In this point of view, antipathy signifies a natural horror and detestation, an insuperable hatred, an involuntary aversion, which a sensitive being feels for some other object, whatever it is, though the person who feels this abhorrence is entirely ignorant of its cause, and can by no means account for it. Such is, they say, the natural and reciprocal hostility between the salamander and the tortoise, between the toad and the weasel, or between sheep and wolves: such is the invincible aversion of particular persons against cats, mice, spiders, &c. a prepossession which is sometimes so violent, as to make them faint at the sight of these animals. Of which and a thousand other antipathies the ancient naturalists, the schoolmen, and the vulgar, form many legends.

ANTIPATRIS, a town of Palestine, anciently called Caphar Saba, according to Josephus, but named Antipatris by Herod the Great, in honor of his father Antipater. It was situated in a pleasant valley near the mountains, in the road from Jerusalem to Cæsarea; forty-two miles from the former, twenty-six from the latter, and seventeen from Joppa, according to Josephus. The apostle Paul and his guard stopped at this place, on their way to Cæsarea. Acts xxiii. 31.

ANTIPAXO, ANTIPASSO or ANTIPACKSU, a small island in the Ionian Sea, near Corfu, and one league south of Paxo. Now included in the republic of the Ionian Isles, though not specified by the name in the enumeration.

ANTIPELARGIA, among the ancients, a law whereby children are obliged to furnish necessaries to their aged parents. The ciconia, or stork, is a bird famous for the care it takes of its parents when grown old. Hence, in some Latin writers, this is rendered lex ciconiaria, or the storks' law. Passavant published a dissertation De Antipelargia, Basil, 1672. 4to.

ANTIPERISTALTIC; from *αντι*, against, *περι*, about, and *σταλτικος*, that which has the power of compressing; in anatomy, a motion of the intestines, contrary to the peristaltic motion. As the peristaltic motion is a contraction of the fibres of two intestines from above, downwards; the antiperistaltic motion is their contraction from below, upwards. Physicians, ancient as well as modern, have usually had recourse to the notion of an antiperistaltic motion, to account for the action of vomiting, and the phænomena of the iliac passion. The cause of the antiperistaltic motion is usually assigned to be a stoppage of some of the intestines, but chiefly of the ilium. Mr. Littre urges many arguments in favor of this doctrine; but some late ingenious authors have overturned the whole antiperistaltic system, and shown this motion imaginary, as well as unnecessary for accounting for these disorders. Mess. Chirac and Du Verney have endeavoured to prove this in respect of vomiting; Messrs. Haguent and St. Andre, in the iliac passion.

ANTIPHATES, in entomology, a species of papilio found in America, and described by Fabricius, from a specimen in the British Museum.

ANTIPHERNA, among the ancient Greeks, denoted a kind of settlement made on a wife in case of surviving her husband, as an equivalent for her dowry. This word seems to answer what in our law is called a jointure.

ANTIPHILUS, a famous painter and the rival of Apelles. He is celebrated for many fine pictures, but most of all for one representing a youth blowing a spark of fire; from which it would appear that the ancients were not ignorant of the magical effects of the chiaro obscuro.

ANTIPHILOGISTIC; from *αντι*, and *φλογιζω*, to inflame; against inflammation; cooling.

AN'TIPHON, *n.* & *adj.* ANTIP'HONAL, ANTIP'HONER, ANTIPHON'ICAL, ANTIP'HONY. } Nearly synonymous with ANTHEM, which see. Alternate singing in sacred music. Opposition of sound.

This litel childe his litel book lerning,
As he sate in the scole at his primere,
He alma redemptoris herde sing,
As children lered hir *antiphonere*.
Chaucer. The Prioresses Tale, vol. ii. p. 52.

Item, II. *antiphoners* of parchmente bought by Mr. Parret for the queere.
T. Warton's Life of Sir T. Pope, App. No. XVII.

Antiphonal singing was first brought into the church of Milan, in imitation of the custom of the eastern churches. *Christian Antiquities.*

Alternate psalmody, for its division into two parts, was commonly called *antiphony*. *Id.*

A sort of office, or service to Saint Edmund, consisting of an *antiphone*, versicle, response, and collect. *Warton's Hist. Eng. Poet.* II. 56.

ANTIPHON, the Rhamnusian, an Athenian orator. He flourished about the year 430 A.A.C. and is said to have been the first who laid down rules of oratory. It is also said he was concerned in establishing the tyranny of the four hundred, and that on this account he was put to death, A. A. C. 411. In the collection of ancient orators there are sixteen orations under his name.

ANTIPHONALLY; from *αντι*, and *φωνη*, voice; in respect of church music, imports as much as alternately, or anthem-wise. The Greeks have a method of singing antiphonally, antiphonatim, called by them *παρακοτακνιον*, wherein two persons sing together, and then are silent, and succeeded by two others, who sing awhile and then are silent, and so on.

ANTIPHONARIUM, ANTIPHONARY, a service book, which contained all the invitatories, responsaries, collects, and whatever else was sung or said in the choir, except the lessons. This is otherwise called responsarium, from the responses therein contained. The author of the Roman antiphonary was pope Gregory the Great. We also find mention of nocturnal and diurnal antiphonaries, for the use of the daily and nightly offices; summer and winter antiphonaries; also antiphonaries for country churches, &c. By the provincial constitutions of archbishop Winchelsey, made at Merton A. D. 135, it is required that one of these should be found in every church within the province of Canterbury. These and many other popish books were forbid to be used by the third and fourth of Edward VI. cap. 10.

ANTIPHONY, in music, the answer made by one choir to another, when the psalm or anthem is sung between two. The word sometimes denotes a species of psalmody, wherein the congregation being divided into parts, repeat the psalms verse for verse alternately. In this sense antiphony differs from symphony, where the whole congregation sings together. It also differs from responsarium, wherein the verse is only spoken by one person, whereas in the former the verses are sung by the two choirs alternately. The origin of antiphonal singing, in the western churches, is referred to the time of St. Ambrose, who, about the year 374, is said to have first introduced it into the church of Milan, in imitation of the eastern church, where it appears to be of greater antiquity; though, as to the time of its institution, authors are not agreed; it was most probably introduced at Antioch between the years 347 and 356. Antiphony also denotes the words given out at the beginning of the psalm, to which both the choirs accommodate their singing. It signifies in a modern sense, a kind of composition made of several verses, extracted out of different psalms, adapted to express the mystery solemnised on this occasion.

ANTIPHRASIS is defined by Sanctius to be a form of irony, whereby we say a thing by denying what we ought rather to affirm it to be: as when we say, it did not displease me; or, he is no fool; meaning, I was pleased with it; or, he is a man of sense. On this principle the antiphrases ought to be ranked among the figures of sentences, and not among those of words. It is a common error to make antiphrases consist in single words; as when we say, that the Parcæ are thus called by antiphrases, because they spare nobody, Parcæ qui nemini parcunt. St. Jerome, in his epistle to Riparius against Vigilantius, says, he ought rather to be called Dormitantius per antiphrasin, than Vigilantius, because he opposed the Christians holding wakes at the tombs of the martyrs. Sanctius holds it improper to call these antiphrases; because phrasis is not applicable to a single word, but signifies orationem, loquendi modum.

ANTIPHTHISICA; from *αντι*, and *φθισις*, corruption; medicines against consumption.

ANTIPHTHORA, in botany; from *αντι*, and *φθορα*, corruption; a species of wolf's-bane, which resists corruption.

ANTIPHYSICA, in medicine, from *αντι*, and *φυσαω*, to inflate; remedies against flatulence.

ANTIPHYSON, from *αντι*, and *φυσις*, nature; an epithet for the loadstone.

ANTIPLEURITICS, medicines against the pleurisy.

ANTIPODAGRICS; from *αντι*, and *ποδαγρα*, the gout; remedies for the gout.

ANTIP'ODES, ANTIP'ODAL. *Αντι*, against, and *πους*, a foot. In geography, those whose feet are opposed to ours on the other side of the earth's surface. Inhabitants of the globe living on opposite sides of it.

> Unto other habitations the same point will be both east and west, as unto those that are *antipodes*, or seated in points of the globe diametrically opposed.
> *Brown's Vulgar Errors.*

> We should hold day with the *antipodes*,
> If you would walk in absence of the sun. *Shakspeare.*

> So shines the sun, tho' hence remov'd, as clear
> When his beams warm th' *antipodes*, as here.
> *Waller.*

ANTIPODES lie under opposite meridians, and opposite parallels; in the same degree of latitude, but of opposite denominations, one being north and the other south. They are 180 degrees distant from each other every way on the surface of the globe; have nearly the same degree of heat and cold, and days and nights of equal length; but in opposite seasons. It is noon to one when midnight to the other; and the longest day with the one is the shortest with the other. Plato is said to be the first person who thought it possible that antipodes existed; asserting at the same time the rotundity of the earth. The ancients in general treat this opinion with the highest contempt; Lactantius and Augustine perplexed themselves in particular with thinking how men and trees could hang pendulous in the air! And Boniface, archbishop of Mentz, legate of Pope Zachary in the eighth century, declared a bishop of that time a heretic for maintaining the existence of antipodes. In fact, until the rotundity of the earth was a doctrine of science fully established, and some consistent ideas of gravitation were connected with it, the supposition of their existence must have been startling enough.

ANTIPODIA, in poetry, a figure by which one foot is changed for another, if both be of equal measure.

ANTIPOLIS, in ancient geography, a colony

of the Massilians, near the river Verus, in Gallia Narbonensis. It is now called ANTIBES, which see.

ANTIPOPE, he that usurps the popedom.

This house is famous in history for the retreat of an *antipope*, who called himself Felix V. *Addison.*

ANTIPOPE. Geddes gives the history of no less than twenty-four schisms in the Romish church, caused by antipopes: some took their rise from a diversity of doctrine or belief, which led different parties to elect each their several pope; but the greater part from controverted rights of election, the fruits of chicane and ambition.

ANTIPRAXIA; from *αντι*, and *πραττω*, I perform; in the ancient physic, denotes a contrariety of functions, temperaments, &c. in different parts of the body, invented to account for that contrariety of symptoms which frequently concur in hypochondriac cases; when e. g. the liver is said to be immoderately hot, and the stomach excessively cold. The moderns, particularly Etmuller, refuse the notion of an antipraxia on this principle, that the blood circulating duly through the whole body, warms all the parts, as well the stomach as liver proportionably. To which some advocates for the ancient system object, that this is confounding the preternatural state with the natural.

ANTIPROBABILISM, the doctrine of those who hold it unlawful to follow the more probable opinion, in opposition to the less probable one.

ANTIPROBOLE, in rhetoric, a figure whereby the defendant adopts or admits the charge brought against him by the prosecutor: e. g. supposing the prosecutor's *προβολη* to be, Titus has killed Caius; the defendant's antiprobole may be, I have killed him; but undesignedly.

ANTIPROPEMPTICON, in poetry, a poem wherein a person going a journey addresses himself to his friends. Such is that of Ovid, lib. i. Trist.—

Cum subit illius tristissima noctis imago, &c.

ANTIPROTASIS, in rhetoric, a solution of the protasis.

ANTIPSORA; from *αντι*, and *ψωρα*, itch; in pharmacy, remedies against the itch.

ANTIPTOSIS, *αντιπτωσις*, a figure in grammar, by which one case is put for another.

ANTIPYRETON; from *αντι*, and *πυρ*, fire; among physicians, an appellation given to the medicines against fevers.

ANTIQUA, in entomology, a species of phalæna found in Europe.

ANTIQUANUS, or ANTIGUANUS, in ornithology, a species of lanius, the Antiguan shrike of Latham, and pie-greische d'Antigue of Sonnerat. It inhabits Panay, one of the Philippine islands, but is chiefly found about Antigue, one of the provinces thereof.

ANTIQUARE, among Roman lawyers, the rejecting of a new law, or refusing to pass it; in which sense antiquating differs from abrogating; as the latter imports the annulling an old law. Antiquare is also used for a law growing obsolete, either by age or non-observance.

In the chief cities of Greece and Italy, there were persons of distinction called antiquaries, whose business it was to show strangers the antiquities of the place, to explain the ancient inscriptions, and to give them all the assistance they could in this department of learning. Pausanias calls them *Εξηγηται*. There is said to have been a college of antiquaries erected in Ireland 700 years before Christ, and to this the Irish historians attribute the correct transmission of the history and antiquities of that kingdom from remote ages. Sir H. Spelman speaks of a society of antiquaries in his time, founded by archbishop Parker, Camden, Sir Robert Cotton, Stowe, and others, who applied in 1589 to queen Elizabeth for a charter. But the death of that princess interrupted their designs, and James I. appears to have disapproved of it.

In 1717 the attempt was revived, and a most respectable society became incorporated by the king's charter in the year 1751, by the name of the President, Council, and Fellows of the Society of Antiquaries of London; their council consisting of twenty-one persons, ten of whom are annually changed: the election of members is by ballot, a certificate signed by three or more fellows being previously exhibited for six ordinary successive meetings, except in the case of peers, members of the privy council, and judges, who may be proposed by a single member, and ballotted for the same day; and the choice is determined by a majority of two-thirds. Every member pays an admission fee of five guineas, and two guineas a year, or an additional sum of twenty-one guineas. They have weekly meetings on Thursday, from seven of the clock in the evening until nine. The society began to publish its discoveries, &c. in 1770, under the title of Archæologia. An Edinburgh society of antiquarians was founded in 1780, and received a royal charter in 1783.

Henry VIII. gave John Leland the title of his antiquary; a title which, says the author of his life, nobody ever enjoyed besides himself; abroad, however, it has not been uncommon. M. Schott, we find, had the title of antiquary to the king of Prussia; P. Pedruzzi, that of antiquary to the duke of Parma; M. Galland resided some time in Turkey, under the title of antiquary of the king of France. The university of Oxford may be said still to have their antiquary under the denomination of custos archivorum.

ANTIQUARII was a name given to copiers of old books in religious houses, who were generally regulars, and lived in monasteries. Some of them were industrious men continually employed in this way, and superseded the poorer librarii, or common scriptores.

ANTIQUARIUM, in antiquity, a place or apartment wherein antique monuments were preserved.

ANTIQUARTAN, a medicine prescribed by Riverius against the quartan ague. It is a preparation of mercurius dulcis, aurum fulminans, sulphur of antimony, and scammony. It is also used for remedies for the quartan ague in general.

ANTIQUARTIUM PERUVIANUM, Jesuits bark.

ANTIQUATA, in conchology, a species of arca found in the Mediterranean, Indian, and American Seas.

ANTIQUATA, a species of chama, found in the Atlantic.

ANTIQUATE, ANTIQUA'RIAN, *n.* & *adj.* AN'TIQUARY, *n.* & *adj.* AN'TIQUATENESS, ANTIQUA'TION, ANTIQ'UE, *n.* & *adj.* ANTIQ'UENESS, ANTIQ'UITY. Lat. *antiquo, antiquus*, from *ante*. To regard as too old, out of date, old-fashioned, or obsolete; to refer to a remote period, as far back as to Grecian and Roman times.

An *antiquarian*, or *antiquary*, is one who is devoted to the study or pursuit of that which is old or ancient. Whoso lust to know more touching the certeyntie and truth of these matters may reade the booke of the excellent *antiquary* John Leyland, intituled the Assertion of Arthur, where euerie thing is more at large discoursed. *Grafton*, vol. i. p. 85.

In what estimaciō the woorde of God was had in old tyme, may euidently appere by those rites and ceremonies as yet be used in ye church, left vnto vs of old *antiquitie*. *Udall. Pref. to John.*

The land which warlike Britons now possess,
And therein have their mighty empire raised,
In *antique* times was savage wilderness,
Unpeopled, unmanured, unproved, unpraised.
Spenser.

Looke backe, who list, vnto the former ages,
And call to count what is of them become:
Where be those learned wits and *antique* sages
Whiche of all wisedome knew the perfect somme.
Spenser's Ruines of Time.

An Egyptian priest having conference with Solon, said to him, You Grecians are ever children; you have no knowledge of *antiquity*, nor *antiquity* of knowledge. *Bacon's Apophthegms.*

Here's Nestor,
Instructed by the *antiquary* times;
He must, he is, he cannot but be wise. *Shakspeare.*

The growth of Christianity in this kingdom might reasonably introduce new laws, and *antiquate* or abrogate some old ones, that seemed less consistent with the Christian doctrines. *Hale.*

Milton's Paradise Lost is admirable. But cannot I admire the height of his invention, and the strength of his expression, without defending his *antiquated* words, and the perpetual harshness of their sound? *Dryden.*

My copper lamps at any rate,
For being true *antique* I bought;
And wisely melted down my plate,
On modern models to be wrought. *Prior.*

Almighty Latium, with her cities crown'd,
Shall like an *antiquated* fable sound. *Addison.*

The sun was hot, but the spirit of *antiquarianism* gave us strength and courage to climb up to the platform of Saint John de Alfarache.
Swinburn. Trav. through Spain.

ANTIQUE is chiefly used among architects, sculptors, and painters; who apply it to such pieces of buildings, sculpture, painting, &c. as were made at the time when the arts were in their greatest perfection among the ancient Greeks and Romans; viz. from the age of Alexander to the time of the irruption of the Goths into Italy, A. D. 400. In this sense the word stands opposed to modern. Thus we say, an antique building, or a building after the antique; an antique bust, or bas-relievo; the antique manner, taste, &c. Antique is also contra-distinguished from ancient, which denotes the lesser degree of antiquity, when the art was not in its utmost purity. Thus antique architecture is distinguished from ancient architecture. Bacon calls antiquities the wrecks of history, or such particulars as industrious and learned persons have collected from genealogies, inscriptions, monuments, coins, names, etymologies, archives, instruments, fragments of history, &c. The study of antiquities forms a very extensive science, or rather comprehends a general acquaintance with all the sciences, as including an historical knowledge of the edifices, magistrates, offices, habiliments, manners, customs, ceremonies, worship, and other objects worthy of curiosity; of all the principal ancient nations of the earth: and the study of them is not matter of mere curiosity, but indispensable to the successful pursuit of many departments of knowledge, to the theologian, who ought to be thoroughly acquainted with the antiquities of the Jews, to enable him properly to explain numberless passages in the Old and New Testaments: to the student of English law, who, without a knowledge of the antiquities of Greece and Rome, can never well understand the foundation of many of our legal maxims and principles; to the historian, the orator, the painter, &c. Inestimable works in this department of literature have been left us by Gronovius, Grævius, Montfaucon, Count Caylus, Winckleman, and D. Iken of Bremen.

ANTIQUO-MODERN, a term of reproach applied to the old Gothic churches, and other buildings; in distinction from those of the Greeks and Romans.

ANTIQUUS, a species of murex found in the northern seas of Europe, and by some ranked as a British shell.

ANTIRATIONALISTS, a name sometimes given to divines, who in matters of religion are for humbling reason, and making it bend to faith.

ANTIREPUBLICAN, opposed to a commonwealth, or democratic government.

ANTIROYALIST. See ANTIMONARCHICAL.

ANTIRRHETICUM, in literary history, a refutation.

ANTIRRHINUM, SNAPDRAGON, or CALVES-SNOUT; a genus of the angiospermia order, belonging to the didynamia class of plants; and in the natural method ranking under the fortieth order, personatæ. Its generic characters are: CAL. five-parted perianth, divisions oblong, the two lower gaping: COR. monopetalous, tube oblong, nectary at the base of the corolla produced downwards and prominent: STAM. filaments four, two short: ANTHER. converging; PISTIL. roundish germ; style simple, stigma obtuse: PERICARP. roundish capsule, bilocular: SEEDS numerous. The essential characters are: CAL. five-leaved; the basis of the COROLLA bent backwards, and furnished with pectoria; CAPSULE bilocular. There are fourteen species of the antirrhinum, ten of which are natives of Britain. 1. A. arvense, the corn-blue toad-flax. 2. A. cymbalaria, the ivy-leaved toad-grass. 3. A. elatine, the sharp-pointed fluellin. 4. A. linaria, the common yellow toad-flax, said to be cathartic and diuretic, but not used in the shops. 5. A. majus, the greater snapdragon. 6. A. minus, the lesser toad-flax. 7. A. monospermum, the sweet-smelling toad-flax. 8. A. orontium, the lesser snap-

dragon. 9. A. repens, the creeping toad-flax. 10. A. spurium, the round-leaved fluellin.

ANTIRRHIUM, in ancient geography, a promontory at the mouth of the Corinthian bay, where it separates the Ætolians from the Peloponnesus; so called from its situation opposite to Rhium in Peloponnesus; both are now called the Dardanelles of Lepanto.

ANTISABBATARIANS, a modern religious sect, who deny the necessity of observing the Sabbath day. The chief arguments of the antisabbatarians are, 1. That the Jewish sabbath was only of ceremonial not moral obligation; and consequently is abolished by the coming of Christ: 2. That no other Sabbath was appointed to be observed by Christ or his apostles; that therefore, although Christians are commanded 'not to forsake the assembling of themselves together,' they ought not to hold one day more holy than another. See SABBATH.

ANTISAGOGE, in rhetoric, a figure differing little from concession. The following passage from Cicero is an excellent instance of it: 'Difficilis ratio belli gerendi; at plena fidei, plena pietatis: et si dicas, magnus labor, multa pericula proponuntur: at gloria ex his immortalis est consecutura. See CONCESSION.

ANTISANA, a hamlet of the Andes, in the kingdom of Quito, elevated according to Humboldt 13,500 feet above the level of the sea. It is the highest inhabited spot on the surface of the globe.

ANTISCEPTIC, something opposed to the reasonings and system of Pyrrhonists, or sceptics.

ANTISCII; from *αντι* and *σκια*; in geography, the people who inhabit different sides of the equator, and who, consequently, at noon have their shadows projected opposite ways. Antiscii is also used, among astrologers, for two points of the heavens equally distant from the tropics: thus the signs Leo and Taurus are held antiscii to each other.

ANTISEPTIC; from *αντι* and *σηπτος*, putrid; an appellation given to such substances as resist putrefaction. Sir John Pringle has made some curious experiments in relation to antiseptic substances, to ascertain their several virtues. Thus, in order to settle the antiseptic virtue of salts, he compared it with that of common sea-salt; which, being one of the weakest, he supposes equal to unity, and expresses the proportional strength of the rest by higher numbers, as in the following table.

Sea-salt . . .	1	Saline mixture .	3
Sal gemmæ . .	1+	Nitre	4+
Tartar vitriolated	2	Salt of hartshorn	4+
Spiritus mindereri	2	Salt of wormwood	4+
Tartarus solubilis	2	Borax	12+
Sal diureticus .	2+	Salt of amber .	20+
Crude sal ammoniac	3	Alum	30+

In the above table the proportions are marked in integral numbers: only to some there is added the sign +, to show, that those salts are possessed of a stronger antiseptic virtue than the number in the table expresses, by some fractions; unless in the three last, where the same sign imports that the salt may be stronger by some units. Some resinous and other substances even exceed the antiseptic virtues of the neutral salts; thus myrrh, asafætida, terra japonica, and aloes, are at least twelve times more antiseptic than sea-salt. Two grains of camphor are equivalent to sixty grains of that salt. An infusion of a few grains of Virginian snake-root, in powder, exceeds twelve times its weight of sea-salt. Peruvian bark and camomile flowers have nearly the same extraordinary quality. Besides these, pepper, ginger, saffron, contrayerva-root, are twelve times more antiseptic than sea-salt. Dried sage, rhubarb, the root of the wild valerian, mint, angelica, ground ivy, senna, green tea, red roses, wormwood, mustard, and horse-radish, were likewise found more antiseptic than the standard. To the class of antiseptic medicines may likewise be added fermented liquors, acids, spirits, and even those plants called anti-acids, and erroneously supposed hasteners of putrefaction, particularly horse-radish. Vegetables, possessing this virtue, are the more valuable, that being usually free of acrimony, they may be taken in much greater quantities than either spirits, acids, resins, or even the neutral salts. Antiseptics are prescribed in all putrid, malignant, and pestilential cases. It is to be remarked, however, that different kinds of them are to be given in different diseases, and in different stages of the same disease. Thus, the bark is a specific in a gangrene, when the vessels are relaxed, and the blood resolved or disposed to putrefaction; but will fail, if the vessels are too full, or the blood be too thick. With the same caution is the bark to be used in wounds, viz. chiefly in cases of absorbed matter, when it infects the humours, and brings on a hectic fever. By the great antiseptic virtue of alum, the bark, and other astringents, it should seem that astriction had no small share in the cure of putrid disorders; and, indeed, the very nature of putrefaction consists in a separation or disunion of the parts. But as astringents are improper to be administered in many cases, contrayerva-root, snake-root, camphor, &c. may supply their place; which, though highly antiseptic, have very little, if any, of an astringent quality.

ANTISIGMA, among ancient grammarians, a sign affixed to those verses whose order was to be changed.

ANTISPASMODIC; from *αντι*, against, and *σπασμος*, the cramp; that which has the power of relieving the cramp. Antispasmodics are more accurately defined medicines proper for the cure of spasms and convulsions. Opium, balsam of Peru, and the essential oils of many vegetables, are the most useful of this class of medicines. Opium excels for its immediate effects: Peruvian balsam, in many instances, produces more lasting and certain benefit than opium. As antispasmodics, the essential oils differ from opium, in that they act more on some particular part than on the system in general, and have no soporific effect. Some medicines remove spasms by immediate contact, as asses' milk, cream, oil of almonds; others by repelling heat, as sulphur, nitre, sal ammonia, &c. Where the strictures are produced by inanition and a defect of vital heat, spasms are best removed by those medicines that restore the natural heat, such as valerian, castor, musk, &c.

ANTISPASTUS, a poetical foot, consisting of four syllables; the first short, the second and third long, and the fourth short.

ANTISTANCARIANS, German protestants who oppose the doctrine of Stancarius, who asserted that justification was the sole effect of Christ's humanity, exclusive of his divinity.

ANTISTATIS, in antiquity, denotes the gibbous part of the liver in the Grecian victims.

ANTISTATIS, in oratory, a defence of an action from the consideration that, had it been omitted, worse would have ensued.

ANTISTES; from *ante*, before, and *sto*, I stand; in ecclesiastical writers, a title usually given to bishops, though sometimes also to priests, or presbyters. Among the ancient Romans antistes was an appellation given to the chief of the priests in the provinces. Females of this rank were called antistæ.

ANTISTHENES, a Greek philosopher, founder of the sect of the cynics. He was born at Athens, and passed the early part of his life as a soldier. His first preceptor was Gorgias, the sophist, but he afterwards became an attendant on the lectures of Socrates. Antisthenes affected great austerity, and often attended Socrates in an old ragged cloak; he permitted his beard to grow, and was scarcely to be distinguished from a common beggar. He prided himself upon the most rigid virtue, and thought himself obliged to attack the vicious wherever he found them. Socrates perceiving this said to him, 'Why, O Antisthenes, art thou so ostentatious; through thy rags I discover thy vanity.' Laertius informs us there were ten volumes of his works; and he has given us many of his apophthegms.

ANTISTITIUM, a term used in ancient chronicles for an abbey or monastery.

ANTISTOECHON, or ANTISTOICHON; from αντι and στοιχειον, letter; a grammatical figure, whereby one letter is used instead of another, as olli for illi.

ANTISTROPHE; from αντι, the contrary way, and στροφη, turning; in an ode supposed to be sung in parts, the second stanza of every three, or sometimes every second stanza; so called, because the dance turns about.

ANTISTROPHE; from αντι, and στρεφω, to turn; a kind of dance in use among the ancients; wherein they stepped sometimes to the right and sometimes to the left, still doubling their turns or conversions. It was customary among the Greeks, on some occasions, to dance round the altars, whilst they sung the sacred hymns, which consisted of three stanzas or parts; the first of which, called strophe, was sung in turning from east to west; the other, named antistrophe, in returning from west to east. They then stood before the altar, and sung the epode, which was the last part of the song.

ANTISTROPHE, in grammar, a figure by which two things mutually depending on one another, are reciprocally converted; as, the servant of the master, the master of the servant.

ANTISTROPHE, in rhetoric. See EPISTROPHE.

ANTITACTÆ, or ANTITACTICI; from αντιτατταω, to oppose; in church history, a branch of Gnostics, who held, that God was good and just, but that a creature had created evil; and consequently that it is our duty to oppose this author of evil, in order to avenge God of his adversary.

ANTITAURUS, a chain of mountains in Cappadocia, extending from Mount Taurus to the Euphrates.

ANTITHENAR, in anatomy, a name given to divers muscles, otherwise called adductors, or adducent muscles; because they act as antagonists to the thenars or abductors. See ANATOMY and ABDUCTOR.

ANTITHESIS; from αντιτιθημι, I oppose. Opposition, contrast.

I see a chief, who leads my chosen sons,
All arm'd with points, *antitheses*, and puns. *Pope.*

ANTITHESIS, in rhetoric, a contrast or opposition of words or sentiments. Such is that of Cicero, in his second oration against Cataline:—'On one side stands modesty, on the other impudence; on one fidelity, on the other deceit; here piety, there sacrilege; here continency, there lust,' &c. Such also is that of Augustus to some seditious young men:—Audite, juvenes, senem, quem juvenem senes audivere. St. Augustine, Seneca, and many other ancient writers, greatly affect antitheses; but among the moderns they are generally decried.

ANTITHETARIUS, a term applied to one who endeavours to discharge himself of the fact of which he is accused by recriminating, or by charging the accuser with the same fact.

ANTITHETON. See ANTITHESIS.

ANTITRAGICUS, muscles of the ear opposite to the Tragus.

ANTI-TRINITARIANS.

ANTI-TRINITARIAN is a term which will obviously include all those professing Christians who deny the doctrine of the trinity; but for an exposition of that doctrine, and for the leading arguments by which it is supported, we must refer to the terms TRINITY and TRINITARIAN. Anti-trinitarians have been usually divided into *Arians* and *Socinians*, or *Unitarians*; (A) the former attribute to Jesus Christ a nature superhuman, though not strictly divine; and to their opinions we propose to devote a distinct article, (see ARIANS); of the latter, the name Socinian is not only considered as a term of reproach (which it is our object altogether to avoid), but also very inaccurately describes the sentiments of those who, in the present age, maintain that Christ was and is but a mere man. These parties indeed usually call themselves *Unitarians*; a denomination on the other hand, which is not recognised by trinitarians, as indirectly implying that such parties only maintain the unity of the Divine Being, a supposition that concedes the point at issue, and which Trinitarians therefore utterly deny. Under such circumstances,

to avoid giving offence on either hand, and considering ourselves, as Encyclopædists, to be rather witnesses than judges between the parties, we have adopted the general and matter-of-fact term *Anti-trinitarian*; and under this head propose to give a brief historical sketch of the controversy between the advocates of the simple humanity of Jesus, and those who maintain his complex nature, as both God and man.

Upon the evidence produced by Anti-trinitarians in favour of the *humanity* of Jesus their opponents have no controversy with them. It is freely admitted by Trinitarians that our Saviour was made 'in all things like unto his brethren.' But they find it difficult, not to say impossible, to consider Him as a mere man to whom are attributed the names and titles, attributes and perfections, usually ascribed to Deity, and to whom heaven and earth, angels and men, are represented as paying worship.

To account for this much has been attributed to the disposition for hyperbole prevalent in eastern nations; much to the warmth of zeal and attachment among the first Christians toward their Master; and it has been hinted that the writers of the New Testament, even St. Paul himself, reasoned sometimes inconclusively, and were therefore liable to error. (B)

It is nevertheless on all hands admitted that the evangelists and apostles, after the memorable day of Pentecost, had correct notions of the person and character of Jesus Christ, and that we must in the first instance derive our knowledge from their writings, widely as we may differ in our method of interpreting them. No conclusions certainly can be more opposed than those which different sects of Christians profess to have drawn from their writings, and this variety of interpretations has led to an enquiry into the testimony of the Christian fathers of the first two or three centuries, which, being far more extensive than the books considered as inspired, might possibly, it has been thought, be more explicit, at least on points which then began to be warmly controverted; and, being nearer the period of the introduction of Christianity, their doctrines were supposed more likely to be correct than those of the succeeding and middle ages. Trinitarians and Anti-trinitarians have therefore minutely examined these records of antiquity, yet unhappily have no more agreed in their report than in their interpretations of the more early writings, considered as sacred or inspired. Thus the controversy has been extended and protracted, instead of being brought to a more speedy or certain determination.

Anti-trinitarians, no less than believers in the trinity, consider their sentiments as not only current in the apostolic age, but as being maintained by some persons in almost every age since. This in point of fact is conceded; only trinitarians rank these doctrines amongst the heresies of the time. It is very clear that even during the life of St. John there were certain parties assumed the Christian name, whom the majority of Christians since have considered as apostates from the Christian faith. Such were the Cerinthians and others, according to the general testimony of antiquity, though Dr. Priestley reckons them among the professors of pure and primitive Christianity.

Cerinthus is considered as the predecessor of Ebion, the reputed father of the Ebionites, and flourished early in the second century, if not before. He believed in the proper humanity of our Saviour; that at his baptism the Holy Ghost descended upon him (which he called the Christ), and that Jesus thereby became endued with miraculous powers. that he truly suffered and died; but that for the Christ to die was impossible. (C)

Whether the Ebionites received their name from a leader of the name of Ebion, or from the Hebrew word meaning *poor*, and either implying an affectation of poverty, or a reproach for its reality, is not important; it is freely admitted that their sentiments were not more orthodox than those of Cerinthus and many other heretics (so called) of the same and the preceding age.

Theodotus, the learned tanner of Byzantium, is supposed by many to have been the first who advocated the simple humanity of Jesus; considering him as a mere man, both in his nature and origin. He flourished toward the latter end of the second century, and was a leader of considerable eminence among the Anti-trinitarians of his age. (D)

In the third century Paul of Samosata, bishop of Antioch, imbibed and defended sentiments very similar to the preceding, and was accordingly excluded by the orthodox from their communion. He believed in the proper humanity of Jesus; and held but one person in the Godhead, namely the Father; though he seems to have admitted a latent existence of the Son and Holy Spirit, as properties, or faculties of Deity, on the union of which to the man Christ Jesus he supposed all the divinity of his character to depend. It seems also that he denied the miraculous conception, as well as the pre-existence of the Saviour. (E)

Until after the reformation this doctrine appears to have had but few advocates comparatively with the number of Arians and Sabellians. At that period it was adopted by some of the noble family of the Sozzini, namely Lælius Socinus, and his nephew Faustus. The former, who was a man of amiable character, chiefly threw out hints by way of doubt and enquiry; but his papers afterwards falling into the hands of his nephew Faustus, who was more bold, the latter wrought his opinions into a system, which has ever since been distinguished by his name. Of these there can indeed be no doubt. He believed Jesus to be the true Messiah, and therefore the Son of God which title he considers as expressive only of his office. He admits the miraculous conception; that Jesus Christ was a prophet of the highest rank, and an example of the purest philanthropy; he explains the priesthood of Christ as consisting in the means he uses to save us from the punishment of our sins; and his kingdom as extending to all the concerns of his church, an honor to which he was raised as a reward for his sufferings, and by which he is entitled to a subordinate degree of worship. He denied the pre-existence of Christ in any superior nature; but accounted for his being said to come 'down from heaven,' and the like expressions

by supposing that after his baptism he was taken up into heaven, and there remained some time to receive instructions in the nature of his sacred office, and the miraculous powers necessary to fulfil it. The Holy Spirit he considered, not as a distinct person from the Father, but as the exertion of divine power and energy. That, however, we may not misrepresent Socinus, we shall give his own words from the most unexceptionable authority.

'It is my judgment,' says he, 'that Christ was a man (Rom. v. 15), conceived and formed in the womb of the Virgin, without the intervention of a man, by the power of the divine Spirit (Mat. i. 20, 23. Luke i. 35), and that being thus born, he was at first capable of suffering and mortal (2 Cor. xiii. 4), till having discharged here on earth the duty assigned him by God, he afterwards ascended into heaven and became immortal, and no longer liable to sufferings (Rom. vi. 9). (G)

Speaking of the 'Son of God,' and the import of that title, he says, 'But Jesus is thus styled principally because he is the person whom his name indicates him to be, namely Christ. Jesus is a name applicable to him merely as a man, but Christ is the name that points out the great eminence and excellence of character conferred on him by God; for the word God is everywhere to be understood after it, as if it had been expressly written, the Christ of God.' (H)

Referring to the texts usually produced in favor of the pre-existence of Christ, Socinus says, 'these passages might refer to a prior existence, if they could not be applied to Christ as a man. Nothing is more probable, and more agreeable to the very words of Christ here and elsewhere, than that Christ himself, after he was born, and before he entered on the office assigned him by his Father, was, in consequence of the divine counsel and agency, in heaven, and remained there for some time; that he might hear from God, and being with him, as the Scripture says, might see the things which he was to announce and to lay open to the world in the name of God himself. The words of Christ himself, John iii. 13, i. 62, are spoken of him as Man, or the Son of Man.' (K)

It is well known that Socinus rejected the received doctrine of the atonement, as well as the proper divinity of our Saviour, and thus he explains himself on the subject: 'The eternal priesthood of Christ is his office and perpetual care for expiating our sins; and Christ expiates our sins, as he frees us from the punishment of them. His deliverance from the punishment of our sins has nothing in common with a satisfaction for them, but is rather repugnant to it. Forasmuch as we are thus saved from the punishment of our sins by Christ, because by his great power in heaven and earth he brings it about, that no other punishment shall reach us.' (L)

It is unnecessary to go farther into the peculiar notions of Socinus; they appear to have originated in making human reason the judge, not only of the evidences of divine revelation, but of the truth or error of the doctrines revealed; and on this subject Dr. Wallis has quoted him as saying, 'as for me, though it (the doctrine of satisfaction) were found written in the sacred monuments, not once, but many times, I would not believe it to be so.' (M) This was a case, therefore, in which he, Socinus, considered it lawful to have recourse to unusual tropes ('inusitatos tropes'), rather than admit a doctrine which he considered as irrational. Trinitarians, however, draw a distinction here; and though they do not admit evident contradictions, they conceive it their duty to reject no point of revealed doctrine, because they cannot exactly reconcile it to their pre-conceived notions or opinions.

Michael Servetus, the martyr of Socinianism in 1553, was a physician of great talents; and is said by some to have anticipated our immortal Harvey in the discovery of the circulation of the blood. Without yielding him this honor, it must be confessed that he was a man of considerable eloquence and acuteness, of great learning and scientific knowledge, and of good morals. He was contemporary with Lælius Socinus, and died just before him. Though more bold and daring than either of the Sozzini, his opinions are not so clearly to be ascertained, being often veiled in mystery, and tinctured with fanaticism. In his philosophy he is accused of being a materialist, (N) a name which at that period was considered as synonymous with atheist. He also agreed with Socinus in rejecting infant baptism, on account of which the Socinians, and many other parties, who assented with them in hardly any point besides, were at this period all confounded under the general name of Anabaptists, and occasioned that body to be charged with almost every heresy in existence.

Anti-trinitarianism now chiefly spread in Poland, where it was introduced by Gonesius, though it is probable he did not embrace all the notions of Servetus; and its advocates enjoyed a free toleration, and full liberty of the press to circulate their opinions. Among these Polish brethren, as they were called, were many varieties of opinion, from those of the ancient Arians to those of Servetus and Francis David (of whom presently), but all of them denominated themselves Unitarians, and were certainly Anti-trinitarians.

Sienienius, palatine of Podolia, also conferred upon them a settlement in the city of Racow, which became the centre of their operations. Here, in 1572, they produced a new translation of the Bible in the Polish language corresponding with their principles; and two years after a catechism, usually called the Racovian catechism, drawn up by George Schoman, which henceforth became the common standard of the party, and from which, therefore, we shall give two or three brief extracts.

'Our mediator,' say they, 'before the throne of God, is a man who was formerly promised to our fathers by the prophets, and in these latter days was born of the seed of David, and whom God the Father has made Lord and Christ; that is, the most perfect prophet, the most holy priest, and the most triumphant king, by whom he created the new world, by whom he sent peace upon earth, restored all things, and reconciled them to himself; and by whom also he has bestowed eternal life upon his elect; to the end that, after the Supreme God, we should believe

in him, adore and invoke, hear his voice, imitate his example, and find in him rest to our souls. (o)

'The Holy Ghost is the energy or perfection of God, whose fulness God the Father bestowed upon his only begotten Son, our Lord, that we, becoming his adopted children, might receive of his fulness.' (p)

The following extract will show that the sentiments of the Socinians, on the doctrine of merit and divine influence, were less heterodox, not only than that of the modern Unitarians, but even than many who class themselves among the orthodox: 'Justification,' say they, 'consists in the remission of all our past sins, through the mere grace and mercy of God, in and by our Lord Jesus Christ, without our merits and works, and in consequence of a lively faith; as also in the certain hope of life eternal, and the true and unfeigned amendment of our lives and conversations, through the assistance of the Divine Spirit, to the glory of God the Father, and the edification of our neighbours.' (q) At this period also it appears, that the Socinians admitted of prayer to Jesus Christ, though of a kind subordinate to that offered to the Supreme Father.

Francis David was superintendant of the Socinian churches, as they were afterwards called, in Transylvania about the year 1572, and endeavoured farther to refine upon the doctrines of Socinus by denying the lawfulness of prayer, or of any kind of religious worship to Jesus Christ; a proposition which seemed so shocking to Faustus Socinus, that he opposed it with all his might, as 'impious and detestable—pestilential and poisonous,' and called the followers of this man 'Semi-Judaizers,' and therefore but half Christians at the best. (r)

David was in consequence thrown into prison, where he died at an advanced age in 1579. And if Socinus did not betray this man into the hands of his enemies and procure his imprisonment, it is admitted that he agreed to his suspension, and advocated the lawfulness of imprisonment for heretical opinions when obstinately maintained, though he resolutely denied that this could in any way apply to himself.

The Polish anti-trinitarians, being, as already hinted, but very loosely united in opinion, were ultimately distinguished into three classes. Some adhered nearly to the Arian system, and were denominated Farnovians, from their leader Farnovius; others kept more closely to the hypothesis of Socinus, and were called after him; while a third party, formed by Budnæus, assumed his name (Budnæans), and went the full length of Francis David, or the late Dr. Priestley. A considerable number of their tracts were collected about the middle of the seventeenth century, and published in six vols. folio, under the title of Bibliotheca Fratrum Polonorum, the two first of which contain the writings of Socinus.

From Poland these Anti-trinitarians spread into Germany, Holland, and England, in each of which they made a few disciples. In England the most considerable were Mr. John Biddle, M. A. of Oxford, and master of the grammar school at Gloucester; and Mr. Thomas Firmin, a most benevolent layman. The latter chiefly contributed to the cause by the excellency of his character, and by the devotion of his property to the circulation of their tracts; but the writings of the former against the trinity excited so much attention as to involve him in much personal trouble, which his zeal supported with the spirit of a martyr. Mr. Biddle's writings produced a very severe ordinance of parliament against heresy, and he was cast into prison; at length Cromwell, who was no friend to persecution, in order to save his life, and calm the public mind, banished him to St. Mary's castle in one of the Scilly Isles. In 1658, however, he was recalled; but after the restoration, was again apprehended for his religious opinions, and died in prison in 1662. (s)

Dr. John Owen was the chief polemical antagonist of Mr. Biddle; and the Socinians afterwards met with very powerful opponents in bishop Stillingfleet, Mr. Alsop, and other writers, both in and out of the establishment; so that the system did not gain much ground among us in the seventeenth century, the chief Anti-trinitarians of that period adopting the Arian or Semi-Arian system. About the middle of the eighteenth century, however, arose Dr. Joseph Priestley, whose energy, talents, and fame as an experimental philosopher, made him the champion of the party; and a controversy was now raised which merits our particular attention, and will chiefly occupy the remainder of this article.

Dr. Priestley, according to his own account, was originally a Calvinist, and a zealous Trinitarian, till nearly 20 years of age, when he became an Arian. In this persuasion he continued fifteen or sixteen years, till at length the course of his own enquiries, and the publications of Socinian writers, led him into their system, on which he continued to refine, till he rested in believing the simple humanity of Jesus, and the homogeneous nature of man. (t)

In 1769 this writer commenced his Theological Repository, which was for several years the great repository of Anti-trinitarianism, and particularly of Socinian writers; besides which, the Doctor, who was a most indefatigable author, published a surprising number of pamphlets, tracts, and even volumes, on subjects of polemical theology, biblical criticism, miscellaneous literature, and experimental philosophy.

About the commencement of the year 1783, Dr. Priestley printed in two volumes his History of the Corruptions of Christianity, which commenced the controversy whereon we are now about to enter. This work (at least at that time) he considered as the most valuable of all his writings. Its avowed object was, to trace the rise and progress of the doctrine of the trinity, and to show that Unitarianism (in his sense of the term) was the general faith of Christians in the apostolic age, independent of the evidence which arose from its being the doctrine of the Scriptures. (u)

In order to establish this point (the only one at present with which we are concerned), Dr. Priestley affirms that the prophets predicted the Messiah only as a man of the house of David, and the tribe of Judah; and that the apostles considered and represented him only as a man—

'a man approved of God.' We are then introduced to the body of Jewish Christians of the first age, who were (as Dr. P. believes) called Nazarenes, as the disciples of Jesus of Nazareth; and Ebionites from their poor and mean condition; just as some of the reformers from popery were called Beghards, or beggars. The Doctor cites the authorities of Origen and Epiphanius to prove that both these denominations relate to the same people, differing only (like the early Socinians) in receiving or rejecting the fact of the miraculous conception; and neither of them, he contends, were reckoned as heretics by any writers of the first two centuries.

Afterwards, according to this historian, Unitarians were divided into two classes: the Docetæ who denied the real humanity of Jesus; and the Ebionites who maintained that he was a mere man and nothing more; but St. John ranks the former only among those who denied or misrepresented his true character. The doctrine of Christ's divinity he concludes therefore to be an error, arising from the personification of the Logos, which, from being an emanation of Deity, was raised to be a divine person. This he further traces to the propensity for allegory and personification which he observes in the apostolical fathers, and even in the principal writer of the New Testament himself, of whom he says, 'The apostle Paul, especially if he be the author of the Epistle to the Hebrews, has strained very much, by the force of imagination, to reconcile the Jews to the Christian religion, by pointing out the analogies which he imagined the rites and ceremonies of the Jewish religion bore to something in Christianity. Clemens Romanus, but more especially Barnabas, pushed this method of allegorising still farther. But the fathers who followed them, by employing both methods, and mixing their own philosophy with Christianity, at length converted an innocent allegory into what was little better than pagan idolatry.' (x)

This work attracted the notice of Dr. Horsley, then archdeacon of St. Albans, a man of considerable literary and scientific eminence, and a most masterly controversial writer. In a charge soon after delivered to his clergy, the archdeacon severely animadverted on several things contained in it, and afterwards published the charge. His censures of Dr. Priestley were comprised under the following heads: reasoning in a circle—quotations misapplied—and testimonies perverted (as alleged) through ignorance of the Greek language, of the Platonic philosophy, and of the phraseology of the earliest ecclesiastical writers. To these faults he selects nine instances, such as he conceives completely to destroy the credit of Dr. P. as an ecclesiastical historian. In the following June, Mr. S. Badcock, a learned dissenting minister, and one of the writers in the Monthly Review, furnished to that work a masterly critique on Dr. Priestley's book, and took the same side of the controversy with Dr. Horsley. In the autumn appeared Dr. Priestley's first series of letters to the archdeacon in answer to his charge, which were replied to in the summer of 1784 by a series of letters from Dr. Horsley.

Dr. Priestley had strongly urged his opponent to go into a general view of the trinitarian controversy, but the archdeacon steadily confined himself to the former topics of discussion, and some incidental matters arising from them: particularly the authority of the writings that go under the name of the apostolical fathers; the rise of the two sects of the Nazarenes and Ebionites; the distinction between the two, and the difference of both from the orthodox Hebrew Christians.

The Unitarian champion had boldly asserted that the doctrine of the trinity, as now generally received, was of no greater antiquity than the council of Nice. (y) Dr. Horsley, on the contrary, contended, that the Christian church was universally trinitarian before that period, and always reckoned those who denied that doctrine, to be heretics. On this position he appealed to the writings of St. John and Clemens Romanus; to the Epistles of Barnabas and Ignatius. (z) Dr. Priestley replied by giving a different interpretation to the passages quoted from the apostle and St. Clement; and, admitting the pieces ascribed to Barnabas and Ignatius to be genuine in the main, he asserts that they bear evident marks of interpolation in what relates to this subject. (*a*) As to the fact of the primitive church being Antitrinitarians, Dr. Priestley asserts that the Ebionites and Nazarenes were Jewish Christians of the earliest age, and did not believe the divinity of Christ, but held him to be simply a man inspired of God. Dr. Horsley, on the contrary, contends that those who were called Ebionites did not exist in the age of the apostles; and also that, though they believed the simple humanity of Christ, they probably held some mysterious exaltation of his nature after his ascension, which made him the object of prayer to them; a circumstance which Dr. P. considers as destitute of all evidence, or probability. (*b*) Dr. P. regards the term Nazarenes as another name for the Ebionites, or the Jewish Christians in general; (*c*) while the orthodox writer insists that, though the first Hebrew Christians might be sometimes called Nazarenes by the heathen (as in Acts xxiv. 5), yet they did not acknowledge the name; that the sect claimed by Dr. Priestley, under that name, as Unitarians, did not exist till after the time of Adrian (in the second century); that they had their name from Nazareth, the place where they settled after they were then driven from Jerusalem; and that even these were believers in the divinity of Christ, although they may be chargeable with some errors and inconsistencies. (*d*)

In this part of the debate, Dr. Priestley quoted the authority of Origen for the assertion that the first Hebrew Christians were Ebionites, and the Ebionites Unitarians. Dr. Horsley endeavours to show that the words of this father would bear a different interpretation; or, if not, that in this case they are of little weight, as they are coupled with an evident falsehood, viz. that the Hebrew Christians had not renounced the law of Moses; and we fear Origen is not the only father who would venture to make an assertion adapted to answer his end in controversy, without much regard to its truth and accuracy. On this occasion indeed the archdeacon goes so far as to unite with Mosheim in saying, 'I would not believe this witness on his oath;' (*e*) which his antagonist resents so seriously as to call Dr. H. a falsifier

of history, and a defamer of the character of the illustrious dead. (*f*)

Dr. P. contends, that the great body of Christians in early times being Unitarians, they could not have been considered as heretics, or persons out of communion with the Catholic church. On the contrary, Dr. Horsley, as we have already observed, denies the assumption, and maintains that the Unitarians were always considered such; and that they were by Justin Martyr included among those heretics whom he charges with blasphemy. (*g*)

Dr. Priestley having quoted a passage from Athanasius, in which that father represents the apostles as cautious in explaining the divinity of Christ to the Jews, on account of their general belief that the Messiah was to be a man only; (*h*) he assumes that these were *Christian* Jews, of which he produces no evidence, and thence concludes, that the first Christian Jews were Unitarians, which the archdeacon considered as totally without foundation. That the first preachers were not so cautious as is here represented, Dr. Horsley infers from the instance of Stephen, whom he considers as a martyr to this doctrine; (*i*) and that those who are said to have 'waited for salvation in Israel,' expected their Saviour to be a divine person, of which he finds evident traces among the Scribes and Pharisees themselves.

Dr. Priestley thinks that there was 'a gradation in the sentiments of learned Christians, respecting the *Logos*, and that the first idea of it was that of something emitted from the divine mind, similar to the supposed emission of light from the sun. But prior to this emission, they considered this Logos as the same principle with *reason*, or some other intellectual power, so that 'by the generation of the Son,' they meant a *change of state*, viz. from a mere *attribute* to a proper *person;* and in their idea this first took place with a view to the creation of the world.'(*k*) Dr. Horsley, however, asserts, that the Logos was never considered a mere attribute of the Deity previous to its assuming a proper personality; but he does not, as Dr. P. states, maintain, that 'by the *generation of the Son* was meant the *display of his powers* in the production of material beings,' as some of the fathers might do; but without curious enquiries into the mysterious nature of the divine Being, the archdeacon satisfies himself with believing the eternal existence of the sacred Three, in the scripture relation of Father, Son, and Holy Ghost. (*l*)

Dr. Horsley admits, as do all Athanasians, that though the Three Persons in the Trinity have each of them equally all the perfections of Deity, the Father, as the *fountain of the Divinity*, has some inexplicable pre-eminence in the divine economy. On the contrary, Dr. Priestley contends, that '*pre-eminence* is inconsistent with any proper *equality*; and that if the members of this trinity be properly equal, they must necessarily be *three Gods* as well as *three persons*.' On this subject Dr. P. remarks, that the three creeds adopted by the church of England were 'drawn up at different times, and all contain different and inconsistent doctrines.' (*m*)

Dr. Horsley having intimated that the Unitarians (anti-trinitarians) do not even pretend that the general tenor of Scripture 'is in their favor, but that they derive it only from particular passages, to which they give a figurative interpretation.' Dr. P. thinks this must have been advanced 'without much reading or much thinking,' it being evident to all acquainted with their writings, that 'they constantly appeal to the general tenor of Scripture, and the plain obvious sense of it. On the contrary, they say, that the Trinitarians cannot find their doctrine either in the general tenor of Scripture, or in any clear passages of it; but that they deduce it only from particular expressions and circumstances, which, when rightly explained, do by no means authorise their conclusions.' (*n*) So different are the inferences of different persons from the same premises; so various their conclusions from the same evidence! It is one thing to infer this argumentatively and in controversy, as Dr. Priestley has done in this instance, and another thing to charge such inferences on parties holding the supposed premises whether they acknowledge them to be just inferences or not. There is a singular, and, as we think, a very indecorous instance of the latter in the article Horsley, Dr. Rees's Cyclopædia.

Lastly, Dr. Priestley having repeatedly insinuated that the doctrine of the trinity was the great barrier to the conversion of Jews and Mahommedans, Dr. Horsley expresses his opinion that the former were most unlikely to admit of his method of expounding the New Testament, and therefore not likely to become converted to his system. As to the Mahommedans, he freely admits the harmony between their creed and that of the modern Unitarians, as it respects the character of Jesus, and yet the experiment has been tried without success: a Socinian has become a Mahommedan, but no Mahommedans have become Socinian Christians. Nor does he conceive it more likely to proceed in the conversion of Deists, however nearly their opinions may approximate, but apprehends Dr. P.'s system of materialism has a tendency rather to lead men still farther from Christianity—even to atheism itself. (*o*)

This charge, however, Dr. Priestley attributes to 'ignorance or malevolence;' conceiving it hardly possible that such can be the serious conviction of his opponent, and treating it as 'utterly unworthy of reply.' And as Dr. Horsley had repeatly charged his antagonist with incompetency for the undertaking, Dr. P. concluded by an appeal 'to all the learned world, whether any man, pretending to scholarship, ever undertook the discussion of a question of literature less prepared for it, or acquitted himself more wretchedly in it as the archdeacon.' (*p*)

The controversy, of which we have given so brief an abstract, was continued in various successive publications from the commencement in 1783 to 1786. Dr. Priestley's first piece, in vindication of Unitarianism, contained eight letters to the archdeacon, with a postscript and an appendix, published in 1783. To these the learned dignitary replied in seventeen letters; and on taking leave of his antagonist, expressed his design of proceeding no farther in the controversy

In the following autumn, Dr. Priestley rejoined in a second set of letters to Dr. Horsley, wherein the 'charge of insufficiency' was warmly retorted, and the archdeacon was stigmatised, (as already remarked,) as a falsifier of history, and a defamer of the illustrious dead. Under these reproaches Dr. Horsley remained silent about eighteen months; but at length renewed the controversy by a sermon at St. Mary's, Newington, on Christmas day 1785; which was followed in the ensuing spring by his 'Remarks on Dr. Priestley's Second Letters to the Archdeacon of St. Alban's, with proofs of certain facts asserted by the Archdeacon.' This tract contained, 1. A collection of new specimens of Dr. P.'s temerity in assertion; and, 2. Arguments in support of the attack upon Origen, and defending the existence of a body of Hebrew Christians at Ælia, after the time of Adrian. It farther animadverted upon the decline of Calvinism among dissenters, and the spirit of Dr. Priestley's writings. These remarks on the second set of Dr. P.'s letters, produced from the latter a third set, in which were farther considered the veracity of Origen, and the existence of a church of orthodox Hebrews at Ælia.

In 1789 Dr. Horsley collected the preceding tracts into a volume, with some additional notes and supplementary disquisitions; and here the controversy on the part of that dignitary closed, as he did not think proper to notice Dr. Priestley's 'History of early Opinions concerning Christ,' then just published in four volumes 8vo. and indeed declared he did not think it worth his while to read them.

In the mean time Dr. Priestley published a fourth series of letters to Dr. Horsley, then promoted to the see of St. David's, and intimated a design of collecting the whole into a volume, with an appendix, after the example of his Right Reverend antagonist, but which was probably prevented by his removal to America.

It will have been but too evident to our readers from the foregoing abstract, that much personality was mingled with this controversy, which may justly be esteemed one of the most memorable of the eighteenth century. Both parties claimed the victory, and each was no doubt 'well satisfied' that he was entitled to it; as were the respective parties of whose opinions they were the able advocates. Accordingly, when both writers were silent in the dust, and their works in some measure rested with them, the friends of each revived and re-animated the contest. In 1812 the tracts of Dr. Horsley were reprinted by his son, the Rev. Heneage Horsley, prebendary of St. Asaph, with an appendix, containing further remarks on some particular points in dispute, and on some more recent opinions and remarks of the learned Jeremiah Jones and Mr. Thomas Belsham. This latter gentleman, equally zealous for his friend and his opinions, as was the prebendary for those of his Right Reverend father, immediately published a new edition of Dr. Priestley's tracts in this controversy, with four additional letters to the bench of Bishops, which had not been before printed.

On the same side with Dr. Priestley, and nearly contemporary with him as a controversialist, appeared another writer in the Anti-trinitarian controversy, a convert from the Established Church, whose name and publications are too remarkable to be omitted, even in this slight sketch of its modern history; we refer to the Rev. Theophilus Lindsey, M.A. It is remarkable, and noticed as such by his biographer (Mr. Belsham), that even after he had 'formed a design of resigning his preferment,' he should solicit a change of living, which required the renewal of his subscription; and that not for interested purposes, but for conveniency —the conveniency of residing near Archdeacon Blackburne, and some other esteemed friends. Here (at Catterick) Mr. L. remained for nearly ten years; and though he disbelieved the doctrines of the Trinity, as taught in the articles and creeds, and practically avowed in the devotional offices of the church, he reconciled himself to the use of it on the Sabellian principles; persuading himself that they were in fact Unitarian, though Trinitarian in expression. (*q*)

Mr. Lindsey was, however, a conscientious man, and could not longer satisfy himself by this subterfuge. In 1773, therefore, he resigned the vicarage of Catterick, seceded from the church, and published his well-known 'Apology' in defence of his Anti-trinitarian sentiments in January, 1774. The design of this work was not only to justify his conduct, but his principles; and contained what his friends considered as a powerful attack on the established faith. This was speedily met and repelled by 'A Scriptural Confutation of the Arguments against the One Godhead of the Father, Son, and Holy Ghost, produced by the Rev. Mr. Lindsey in his late Apology,' the production of a Mr. Burgh, member of the then Irish parliament. Though pronounced by Mr. Belsham to be 'trifling in the extreme,' the work was well received at the time, and highly approved of by Dr. (afterwards Bishop) Hurd, and other respectable members of the Established Church. (*r*)

Another answer was published by Mr. Bingham of Dorsetshire, entitled, 'A Vindication of the Doctrine and Liturgy of the Church of England,' &c.; and a third by Dr. Randolph, then Lady Margaret's professor of divinity at Oxford. To all these Mr. Lindsey replied in a 'Sequel to his Apology,' of which, as it is considered 'the most elaborate of all his publications,' and a 'standard' (*s*) of modern Unitarianism, we shall give a very brief analysis.

The work opens with some account of the trial and sufferings of Mr. Ellwall for heresy and blasphemy in the reign of George the First, followed by extracts from Hopton Haynes, Esq. an Anti-trinitarian writer of the same period. Then follows an examination of the subordinate worship of the Arians and Socinians, demonstrating that it has no foundation in the New Testament; and chapters third and fourth explain the Logos to be the 'wisdom and power of the Father.' The author next examines critically the passages from the New Testament, and particularly from St. John, in favor of the pre-existence of Christ; and in the sixth chapter combats the ingenious hypothesis of the Rev. Henry Taylor, author of a series of letters under the signature of 'Benja-

min Ben Mordecai, a converted Jew.' The seventh chapter proves what is no part of this controversy, that our Saviour was truly a man; the eighth considers the testimony of the apostolical fathers in relation to the person of Christ; and the last attempts to prove that the creation ascribed to Christ in the New Testament, intends only 'the new creation, or the moral renovation of the world.' (*t*)

In 1779 Mr. L. published Two Dissertations, 1. On the Preface to St. John's Gospel. 2. On praying to Jesus Christ. In the first of these (as in his Apology) he explains the Logos, not of Jesus Christ (as the Socinians used to do) but of 'the word, wisdom, and power of God, communicated to him, and manifested by him.' In the second, Mr. L. maintains that religious worship is not due to Jesus Christ, because 'he is a man and not God—that he never taught men to worship himself—that worship is not deducible from his offices and powers—that the apostles never teach it—that there is no sufficient precedent or example in the New Testament; under which head the learned writer gives an able, and in general (says his biographer) a very satisfactory analysis of those texts commonly produced in favor of the worship of Jesus Christ.' (*u*) Trinitarians, however, continued to think differently, though they admitted the consistency of rejecting the worship of Christ in those who had rejected his divinity.

In 1781 Mr. Lindsey published a 12mo. work called The Catechist, which he threw into the form of dialogues between Artemon and Eusebes, on the unity of God, and in which he boldly maintains that, 'It is a thing utterly impossible that a being should be God and man; Creator and creature;' &c. 'These things (he adds) are not compatible: we should be shocked at their absurdity if they were not instilled into us before we began to make use of our reason, and if many were not afterwards afraid to make use of it about them, suffering themselves to be dazzled by great names and authorities, and imposed on by high antiquity, which can give no prescription to what is unintelligible and impossible.' (*v*)

In the spring of 1783 Mr. Lindsey committed to the press a work which he had been long preparing, and which he entitled, An Historical View of the State of the Unitarian Doctrine and Worship from the Reformation to our own Times. 'This,' says his biographer, is 'an elaborate work, one of the most interesting and important of Mr. L's publications.' (*w*) We shall introduce Mr. Belsham's analysis of its contents:

'In pursuance of his design the worthy author begins with representing the state of the Unitarian doctrine at the beginning of the Reformation, and exhibiting the superior advantages then enjoyed for understanding the Scripture in this respect; he then notices the promising state of the Unitarian doctrine in England at the time of the Reformation, with the violent means used to suppress it; he next treats of the worship of Jesus Christ by Socinus and his followers, and particularly enlarges upon the controversy on this subject between Faustus Socinus and Francis David, and upon the severity exercised towards David and others for refusing to acknowledge Christ as an object of religious worship. In this chapter Mr. Lindsey introduces a section in reply to some severe and unfounded remarks of bishop Newton upon the Unitarians. The succeeding chapter exhibits the state of the Unitarian doctrine in the reign of queen Elizabeth and of the Stuarts: and the author here explains the cause of the great silence concerning the Divine Unity during this period, and gives some account of that truly eminent confessor John Biddle, M. A. of the university of Oxford, who, for the profession of his principles, was banished by Cromwell to the Scilly Islands, and afterwards died in prison. Then follows an account of the state of the Unitarian doctrine and worship from the Restoration to the close of the seventeenth century, in which is included a brief memoir of the celebrated Mr. Thomas Firmin, merchant of London, a disciple of Biddle, and his protector and friend; a man eminently useful in his day; the friend of Whichcote, Burnet, and Tillotson; an avowed and zealous Unitarian, but who hesitated not to conform to the worship of the Established Church, justifying his conduct, but surely erroneously, upon the principles of Dr. Wallis and the Oxford divines in the controversy with Dr. Sherlock, that the three persons in the Trinity were nothing more than three different characters, or relations of one and the same Being. In the following chapter the author describes the state of the Unitarian doctrine and worship in the eighteenth century: and here he gives a particular account of the opinions and writings of Emlyn, of Whiston, of Dr. Samuel Clarke, of Bishop Hoadley, of Sir Isaac Newton, and of Abraham Tucker, the author of a curious and profound work entitled The Light of Nature pursued, by Edward Search, esq. The concluding chapter contains a relation of some circumstances favorable of late years to the progress of the doctrine of Divine Unity, in which the worthy author, after representing the benefit accruing to the cause of truth from an open defence and maintenance of it, records some recent public declarations in favor of the Unitarian doctrine and worship, by an open and avowed separation from the worship of the Church of England. And in particular he relates the circumstances of the first rise of the church of Unitarian Christians assembling in the chapel in Essex-street, to which he annexes a brief memoir of some eminent persons who had honorably and from a sense of duty, avowed Unitarian principles, and some of whom had for conscience sake resigned lucrative situations, and fair prospects of preferment in the national church. To this honorable catalogue are the highly respected names of Dr. Robertson, Dr. John Jebb, Dr. Chambers, Mr. Tyrwhitt of Jesus College, Cambridge, Mr. Evanson, Mr. Maty, Mr. Harris, and Dr. Disney.' (*x*)

It is certainly to the honor of these worthies, as Mr. Belsham calls them, that they sacrificed their interest to their conscientious scruples; but this weighs not a feather in the scale of argument, as Trinitarians have certainly done much; and this kind of argument, if brought

forward on the opposite side, would probably have been called 'trifling in the extreme.' It it is not the suffering but the cause that constitutes the martyr.

In September following a society was established for Promoting the Knowledge of the Scriptures by critical and anti-trinitaran exposition; but notwithstanding Drs. Disney, Jebb, Kippis, Price, Calder, Toulmin, Law, &c. were among its members, it did not succeed according to expectation, which is chiefly attributed to Dr. Priestley's resumption of his Theological *Repository*. At their dissolution however, they left a monument of their labors in two volumes of Commentaries and Essays, among which were some by Messrs. Lindsey, Dodson, Evanson, Tyrwhitt, and Henry More. (*y*)

In 1785 Mr. Lindsey published, without his name, an Examination of Mr. Robinson of Cambridge's Plea for the Divinity of our Lord Jesus Christ, by a late member of the university. The tract here referred to had been published nearly nine years without meeting with a reply, the first edition being dated in 1776. During that period it had been extensively read, and admired by Trinitarians, both in and out of the establishment. Among the former were Dr. Hinchcliffe, bishop of Peterborough; Dr. Halifax, afterwards bishop of Gloucester; Dr. Goddard, master of Clare Hall; Dr. Ogden, Woodwardian professor; Dr. Cooke, provost of King's College; Dr. Beadon, afterwards bishop of Gloucester, at that time public orator; and Dr. Tucker, dean of Gloucester; and, it was pretty generally agreed, that the plea was the best defence of the divinity of Christ which had been published. Among the dissenters, Drs. Stennett and Evans, (Messrs. Daniel Turner and Josiah Thompson, of Clapham), admired the work, and complimented the author. (*z*) Archdeacon Blackburn, who was a kind of middle man, thus writes in the year 1781—'When Mr. Lindsey's Apology came out, I read it, and thought some things in it well enough. In other passages he seemed to me to be infirm in his proofs. I then read several answers to him, which, among a few tolerable hits, had a considerable mixture of weakness and absurdity. About five years ago, I know not what chance threw in my way a pamphlet, entitled a Plea for the Divinity of our Lord Jesus Christ. I perused this pamphlet with care and attention, and was both surprised and concerned to find so many of my friend Lindsey's arguments and positions totally subverted, *à fundamento*, providing the pleadings, reasonings, and authorities were well-grounded. To prove this to myself, I consulted a number of the texts he had cited, and found his superstructure bottomed upon a rock. It is now six years since this pamphlet was first published. I have looked in every newspaper, review, magazine, that I met with, and could never find an answer to it, either from Mr. Lindsey, Dr. Jebb, Dr. Priestley, or even Mr. Evanson, who, I think, is one of the best writers among the Socinians, or ancient or modern. Indeed, so far as concerns the Socinians. I think, it unanswerable.' (*a*)

The effect of this piece on the Unitarian (or Anti-trinitarian) writers seem to have been astounding. They looked at each other, and all agreed it was 'very superficial,' 'and needed no confutation,' yet they all wished it were answered, and 'thought a reply of some kind advisable,' though no one appeared willing to undertake the task. At last Mr. Archdeacon Blackburn asked Mr. Lindsey in triumph 'How can you go on in Essex street without confuting this work?' This roused his zeal, and he wrote to the 'Cambridge men,' but they declined to interfere. 'I often wonder at myself,' said he, in a letter to a friend, 'and am often not a little drooping, to think how I should venture on the public, when certain persons, so much more able and capable, are silent.' (*b*) Yet the formidable work he was about to reply to was but a pamphlet, (we believe published at eighteen-pence) which, according to Mr. Belsham, 'breathes throughout a most amiable spirit of candor;' but which, in point of argument, was 'egregiously trifling, very superficial, and would not long deceive any one;' or, according to Mr. Lindsey himself, was composed of 'triumphant nonsense and declamation.' (*c*)

This tract, however, it may be proper to inform our readers, was neither mere declamation nor dry reasoning. It placed the New Testament first in the hands of a Jew, then of a Gentile, and considered in what light the argument for Christ's divinity must appear to the one and to the other. This method of arguing was somewhat new, and, as appears to us, very forcible, while the style in which it was exhibited gave it the effect of a charm upon the reader. We must now, however, attend to the reply of Mr. Lindsey, which will give the reader a further insight into the tract of his opponent, and the train of his reasoning.

'The learned writer, in his examination of the Plea, pursues Mr. Robinson's method, and examines and sifts his popular opponent's defence of the divinity of Christ, argument by argument, and text by text. Accordingly, he enquires in order, whether the sacred writers speak of God in peculiar appropriated terms?—whether Jesus Christ is the supreme God?—whether the same titles are given to Christ in the Christian Scriptures which are given to God in the Jewish Scriptures?—whether the perfections which are ascribed to Christ are the same with those which are ascribed to the supreme God?—whether the like worship is given, or commanded to be given, in the Scriptures to Jesus Christ as to Almighty God?— whether there be any passages in the Old Testament, and applied to Jesus Christ in the New, which prove Jesus Christ to be Jehovah the supreme God?—whether the Scriptures which foretell the destruction of idolatry by the gospel have not been fulfilled although Jesus Christ be wrongly worshipped as God?—whether, if Jesus Christ be not the supreme God, Mahomed has written more clearly on the nature of Jesus Christ than the apostles have?—whether numberless passages of scripture have no sense, or a very absurd one, if Jesus Christ be a mere man?—and, finally, what is the source of men's erroneous opinions concerning the person of Christ, according to the author of the Plea.' (*d*)

'After having,' says Mr. Belsham, 'with great ability and learning discussed these important questions,' Mr. Lindsey 'animadverted with a warmth and severity more than usual with him upon the presumption, the ignorance, and the dogmatical spirit of the writer,' which appears to us rather extraordinary, since this same Mr. Belsham tells us Mr. Robinson's plea was 'written with great ingenuity, and breathes throughout a most amiable spirit of candor.' (e) But there are many extraordinary things in religious controversy.

'The success of this examination,' says Mr. Belsham, 'was complete. From the time that it was published, no person who had the least pretension to biblical learning, was heard to open his lips in defence of the famous plea for the Divinity of Christ; not a syllable was written in confutation of the reply.' (f) It will not be necessary to suppose this was on account of that reply being 'egregiously trifling,' or 'very superficial;' the reason given by the author of the plea, perhaps influenced others. 'I do not intend,' said he, 'to answer the *anonymous* examiner. He hath not touched my arguments; and his spirit is bitter and contemptuous. His faith stands on criticisms; and my argument is, that if the doctrine require critical proof, it is not popular, and therefore not divine. Yes, they will have the last word, and let them.' Upon the subject of criticism, it was indeed Mr. R's opinion that, 'criticism is a good thing in its place,' that is, by way of illustration; 'but woe be to the system that rests upon it.' (g) And if christianity be intended for the common people, the multitude, there seems to us considerable force in the argument; for these can in few cases be critics. Indeed, Anti-trinitarian writers have often adopted this mode of argument themselves, when it has suited their design. The doctrine of the trinity cannot be true, they say, because it is above the capacities of the common people. (h) It is admitted, however, that Mr. Robinson changed his opinion on this momentous subject, but not, so far as appears, in consequence of Mr. Lindsey's reasoning. Truth, however, is not affected by the versatility of man. If the arguments of Robinson are unanswerable, as many still think, his change of opinion will not invalidate them any more, than the conversion of an Anti-trinitarian to the orthodox faith will prove the doctrine of the trinity.

Mr. Lindsey's next publication was, an Address to the Students of the two English Universities in vindication of his friend Dr. Priestley from the attack of Bishop Horne, then Dean of Canterbury and president of Magdalen College, in which he appears to have fully embraced Dr. P's opinions, even to denying the inspiration of the Scriptures. In a second address Mr. Lindsey attacks the Bampton Lectures of Mr. Hawkins on the Trinity; and attributes, as Dr. P. had before done, the invention of that doctrine to 'the honest enthusiasm of Justin Martyr.' In this publication Mr. Lindsey alludes to the last opinions of Dr. Watts, which are supposed to have been materially changed. Mr. Belsham, however, candidly confesses that Watts never regarded himself as a Socinian, but would probably to the latest day of his life have started from the imputation with horror! (i)

We have said that Mr. Lindsey latterly went into the sentiments of Dr. Priestley to their full extent, or nearly so, though for some time he objected and remonstrated against their publication. 'Concerning it I would first say,' said he, 'that granting him to have proved this fact, that our Saviour was as much in the dark as the most vulgar among the Jews about possessions, and believed them in the gross literal sense; and if also he was in ignorance of the Scriptures of the Old Testament, and misapplied them, yet our friends had no call whatever to tell this to the world, because it would increase the prejudices of multitudes against him, and hinder others less indisposed from reading his works.' (j) 'If our friend had been pressed upon this point in the way of controversy,' he adds, 'I should have said nothing against his delivering the sense of his own mind; but as things now stand, to go on to attack a character (Jesus Christ) held in such different universal estimation, unprovoked, seems to me likely to do harm and no good.' (k) If this indeed be modern Anti-trinitarianism, well might Mr. Belsham say, not only that Dr. Watts would have started from it with horror, but even Socinus himself.

In the year 1786 Mr. Lindsey had opened a correspondence with the Anti-trinitarians in the United States of America, and received information that an Episcopal Church at Boston, had lately adopted a reformed Liturgy, similar to that used by Mr. L. in Essex-street chapel; and the pleasing news of the spread of Unitarianism in America, probably prepared the way for Dr. Priestley's emigration in 1794, where we shall leave him to return to notice the two last works of Mr. Lindsey, his Conversations upon Christian Idolatry, and on the Divine Government.

The former are said to have had some foundation in fact, and relate, as will easily be anticipated, to the supposed criminal practice of worshipping Jesus Christ. The last work is also in dialogue, and contains conversations between the same parties as the preceding, and embraces the several topics of miracles—the goodness of Providence—the Mosaic History—excellence of the Gospel—divine appointment of natural and moral evil—human responsibility—universal salvation—and terminating in Pope's celebrated maxim in reference to the doctrine of necessity that, 'whatever is, is right. This work, however has little reference to our subject; and its contents are only mentioned to show the points arising from the doctrines of Anti-trinitarianism and to what the system may lead. Upon existing controversies, and the merits of living writers, in an article designed to be historical we forbear to enter.

NOTES TO THE FOREGOING ARTICLE.

(A) The Noetians and Sabellians take a middle course; and, though they do not believe in a trinity of persons, they admit the union of Jesus to the divine nature. See, in the article TRINITY, *Indwelling Scheme*.

(B) See *Priestley's* Corruptions of Christianity, vol. ii. 370. 'I would also refer to what I have written under the signature of *Paulinus* in the *Theological Repository*, in which I think I have shown that the apostle *Paul often reasons inconclusively*; and therefore that he wrote as any other person of his turn of mind and thinking, and in his situation, would have written, *without* any particular *inspiration*.'

(C) *Lardner's* Hist. of Heretics, pp. 147. 150.

(D) *Mosheim's* Comment (by Vidal), vol. ii. p. 202, &c.

(E) Ibid. p. 365.

(F) *Mosheim's* Eccles. Hist. Cent. III. p. 12. ch. v. 15.

(G) *Mosheim's* Eccles. Hist. by Maclaine, Cent. XVI. sect. iii. pt. 2. ch. iv.

(H) Quoted (from Soc. Op. tom. i. p. 654) Toulmin's Mem. of Socinus, p. 178.

(I) Ibid. 179.

(K) Ibid. 182.

(L) Ibid. 185.

(M) *Wallis's* Letters on the Trin. let. iii. p. 47.

(N) See *Mosheim's* Hist. Mich. Serveti; and Eccles. Hist. Cent. XVI. sect. iii. pt. 2. ch. iv. 5.

(O) *Mosheim's* Eccles. Hist. Cent. XVI. sect. iii. pt. 2. ch. iv. Note 2.

(P) Ibid.

(Q) Ibid.

(R) Toulmin's Socinus, p. 81. &c. It is remarkable that Dr. T., in an apology for Socinus, has recourse to exactly the same arguments that others have in vain employed in defence of Calvin in the matter of Servetus. See pp. 94. 105. 112.

(S) See Toulmin's Life of Biddle.

(T) Preface to Letters to Dr. Horsley, p. v. &c.

(U) Ibid. p. vii.

(X) *Priestley's* Hist. of Corrupt. vol. i. p. 24.

(Y) Hist. of Corrupt. vol. i. pt. 1 & 3.

(Z) First Letters to Priestley, let. x.

(a) *Priestley's* Tracts, p. 162. 472.

(b) Ibid. pp. 162, 473.

(c) Hist. of Corrup. vol. i. p. 7. Tracts, pp. 111. 196. 470.

(d) *Horsley's* Tracts, pp. 32. 180, &c.

(e) *Horsley's* let. vii. in reply to Priestley, and note p. 178.

(f) *Priestley's* Tracts, p. 474.

(g) *Priestley's* Tracts, pp. 35. 205. *Horsley's* do. let. ix.

(h) *Priestley's* Tracts, pp. 476-7.

(i) *Horsley's* Tracts, let. xi, xii.

(k) *Priestley's* Tracts, p. 45, &c.

(l) *Horsley's* Tracts, pp. 58, &c., and Disquisit. iv. p. 513.

(m) *Priestley's* Tracts, pp. 165. 481.

(n) Ibid. 482.

(o) *Horsley's* Tracts, let. xvi.

(p) *Priestley's* Tracts, p. 482.

(q) *Belsham's* Mem. of Lindsey, p. 23 and note.

(r) Ibid. pp. 129, 130.

(s) *Belsham's* Lindsey, pp. 132—134.

(t) Ibid.

(u) *Belsham's* Lindsey, p. 150.

(v) Ibid. 154.

(w) *Belsham's* Lindsey, p. 158.

(x) Ibid. p. 161—163.

(y) Ibid. 178.

(z) *Dyer's* Life of Robinson, p. 109.

(a) Archd. *Blackburn's* Works, appendix to Memoir.

(b) *Belsham's* Lindsey, p. 186, note.

(c) Ibid. 179, 185, 186.

(d) *Belsham's* Lindsey, pp. 187, 188.

(e) Ibid. p. 179.

(f) Ibid. 189.

(g) *Dyer's* Life of Robinson, p. 113, and Belsham's note, p. 190.

(h) *Dyer's* Robinson, p. 397.

(i) *Belsham's* Lindsey, p. 217.

(j) Ibid. p. 223.

(k) Ibid. 224.

ANTITYPE; *αντι* and *τυπος*. The rude sketch or outline of any work.

He brought forth bread and wine, and was the priest of the most high God; imitating the *anti-type*, or the substance, Christ himself. *Taylor.*

When once upon the wing he soars to an higher pitch, from the type to the *antitype*, to the days of the Messiah, the ascension of our Saviour, and, at length, to his kingdom and dominion over all the earth. *Burnet's Theory.*

ANTITYPE, among divines, is variously interpreted. It occurs twice in the New Testament; viz. in the epistle to the Hebrews, ix. 24, and in St. Peter, 1 Ep. iii. 21, where its genuine import has been much controverted. The former says, 'Christ is not entered into the holy places made with hands, which are (*αντιτυπα*) the figures or (antitypes) of the true, now to appear in the presence of God for us.' Now *τυπος* signifies the pattern by which another thing is made; and as Moses was obliged to make the tabernacle, and all things in it, according to the pattern showed him in the mount; the tabernacle so formed was the antitype which was shown to Moses; any thing, therefore, formed of a model or pattern, is an antitype. In the latter passage, the Apostle, speaking of Noah's flood, and the deliverance only of eight persons in the ark from it, says, *Ω και ημας αντιτυπον νυν σωζει βαπτισμα*, 'baptism, being an antitype to that, now saves us; not the putting away the filth of the flesh, but the answer of a good conscience towards God, &c.'

ANTITYPE among the ancient Greek fathers, and in the Greek liturgy, is also applied to the symbols of bread and wine in the sacrament. Hence it has been argued by many protestants, that the Greeks do not really believe the doctrine of transubstantia-

tion; because they call the bread and wine antitypes, *αντιτυπα*, q. d. figures, similitudes; and this even after the consecration.

ANTIVARI, a strong fortified town of Albania, in European Turkey, seated on a rock in the Adriatic Sea. It was taken from the Venetians by the Turks in 1573. It is the see of a Catholic archbishop, and lies thirty-eight miles south-east of Ragusa.

ANTIVEDUTO, in biography, an eminent painter born in 1552 near Rome, and educated under the care of Giovanni Dominico Perugino. He became a portrait-painter of the highest reputation, and was employed by the Medicean family. He had likewise a considerable talent for historical painting.

ANTIVIRGILIAN HUSBANDRY, a name that has been sometimes given to the drill-husbandry of Mr. Tull.

ANTIUM, in ancient geography, a city of the Volsci, situated on the Tuscan Sea, with a harbour. At a neighbouring hamlet called Ceno, the Romans gained their first naval reputation against the Antiates; part of whose ships they conveyed into the arsenal of Rome, and part they burnt; and with their beaks or rostra adorned the pulpit erected in the Forum, thence called rostrum. Addison says, there were two Fortunæ worshipped at Antium. It was destroyed by the Saracens, and is now extinct, but a vestige of the name still remains in Capo d'Anzo, or Antio. This town is distinguished on one medal by the inscription ANTI, and an effigy of Hercules with his club; and as a Roman colony on a medal of Nero inscribed COL. ANTIAT. LEG. III. ITALICA.

ANTIUS, a son of Hercules, and the supposed founder of Antium.

ANTLER, } Fr. *andoillier*, or *antoillier*.
ANT'LERED. } Properly the first branch of a deer's horns; but more frequently applied to the branches severally.

Grown old, they grow less branched, and first lose their brow *antlers*, or lowest furcations next the head. *Brown.*

A well-grown stag, whose *antlers* rise
High o'er his front, his beams invade the skies.
Dryden.

Bright Diana
Brought hunted wild goats' heads, and branching *antlers*
Of stags, the fruit and honour of her toil. *Prior.*

A stag sprang from the pasture to his call,
And kneeling lick'd the wither'd hand that tied
A wreath of woodbine round his *antlers* tall,
And hung his lofty neck with many a flowret small.
Beattie's Minstrel, book ii.

They found
Ulysses, dear to Jove, hemm'd all about
By Trojans, as the lynxes in the hills,
Adust for blood, swarm round the *antler'd* stag,
Pierc'd by the archer.
Cowper's Homer's Iliad, book xi.

ANTLER, among sportsmen, a start or branch of a deer's attire.—Antler bes, the branch next above the brow antler.—Antler brow, the branch next the head.

ANTLIA, an ancient machine, supposed to be the same with the pump. Hence the phrase, in antlium condemnari, denotes a kind of punishment, in which criminals were condemned to drain ponds, ditches, or the like.

ANTŒCI, Lat. from *αντι* and *οικεω*, to inhabit: in geography, those inhabitants of the earth, who live under the same meridian, and at the same distance from the equator; the one towards the north, and the other to the south. Hence they have the same longitude, and their latitude is also the same, but of a different denomination. They are in the same semicircle of the meridian, but opposite parallels. They have precisely the same hours of day and night, but opposite seasons; and the night of the one is always equal to the day of the other.

ANTOINE, a town of France, in the department of Isere, with a celebrated abbey. It is seated among the mountains, thirteen miles east of Lyons.

ANTOINETTE.

ANTOINETTE (Marie Josephe Jean de Lorraine), the late amiable and unfortunate queen of France, was the daughter of Francis the First, emperor of Germany, and the celebrated Maria Theresa. She was born November 2, 1755, the day of the dreadful earthquake at Lisbon; a catastrophe which is said, during the progress of her misfortunes, to have frequently recurred to her mind. At seven years of age she lost her father; and while the energetic character of her remaining parent ever inspired her with admiration and awe, she seems to have conciliated little of the affection of her children. Madame Campan, to whose interesting 'Memoirs of Marie Antoinette,' we shall be considerably indebted in this sketch of her life, says, 'She never desired to place between her own children and herself that *distance* which had existed in the imperial family. She cited,' continues this writer, 'a fatal consequence of it, which had made upon her such a powerful impression as time had never been able to efface. The wife of the emperor Joseph II. was taken from him in a few days, by an attack of small-pox of the worst kind. Her coffin had recently been deposited in the vault of the imperial family. The archduchess Josepha, who had been bethrothed to the king of Naples, at the instant she was quitting Vienna, received an order from the empress not to set off without having offered up a prayer in the vault of her forefathers. The archduchess, persuaded that she should take the disorder to which her sister-in-law had just fallen a victim, looked upon this order as her death-warrant. She loved the young archduchess Marie Antoinette tenderly; she took her upon her knees, embraced

her with tears, and told her she was about to leave her, not for Naples, but never to see her again; that she was going down then to the tomb of her ancestors, and that she should shortly go again, there to remain. Her anticipation was realised; a confluent small-pox carried her off in a very few days, and her youngest sister ascended the throne of Naples in her place.' The marriage of the young archduchess with Louis XVI. then dauphin of France, was a political measure of the duke de Choiseul; and the marquis de Durfort, as proxy, performed the ceremony at Vienna, in the name of that prince, in the spring of 1769. On the arrival of the young bride at Kehl, on the frontiers of France, a species of established etiquette was attended to, which will appear curious to some of our readers. By this it had been long decreed that a foreign princess who married a son or prince of France, was to be met at the frontiers with her wedding-clothes; the young princess was to be undressed at the pavilion usually erected at the frontiers on such an occasion, and every article of her apparel, without exception, was changed. Marie Antoinette was met at Kehl by the countess de Noilles, as her future maid of honor; the duchess of Cossè, the bishop of Chartres, and the usual suite of a dauphiness of France. To the first of these ladies, as a perfect mistress of the art, was assigned the task of instructing the dauphiness in the then rigid etiquette of the French court; while of her early and Austrian guides she retained about her person the abbé de Vermont. The influence of both these personages will be seen to have deeply affected her future conduct and destiny. The old and wretched Louis XV. is said to have been enchanted with this blooming accession to the charms of his court. He put into her hands the valuable jewellery of the late dauphiness; the princesses, his daughters, made her magnificent presents; and she seems early to have conciliated more of sincere personal attachment in the royal family than is usually found in court circles. Her husband only was rigidly cold and insensible to all her attractions. United with her by the ties of ceremony, and in receiving the public demonstrations of homage and joy upon their marriage, he is said to have allowed his indifference to degenerate during the early part of their union, even into occasional rudeness. The duke de Choiseul and his party had, by the successful intrigues of their rivals, been driven from court—a divorce is stated to have been in contemplation: and the accurate chronicler of this unhappy princess's history and feelings above alluded to, assures us, that for a period of above eight years, he had avoided to consummate that union! In May, 1774, terminated the mortal career of Louis XV. It was customary on such occasions for the whole of the royal family to leave the palace: the horses therefore were ready harnessed in the stables against the expected event; to whose keepers the signal of extinguishing a taper at the king's window, was to announce his actual decease. Custom also required the body to be opened and embalmed; and the first gentleman of the bed-chamber, the duke de Villequier, on leaving the room, ordered the chief surgeon to perform the operation. His majesty died of a confluent small-pox; and the death of the operator, it was apprehended, must have ensued. 'I am ready,' replied he, therefore, 'but while I operate, you must hold the head, a duty which *your* office imposes on you.' The duke went off without saying a word more, and the body was neither opened nor embalmed; a few under-servants and poor workmen only continuing with it, and paying the last duty to their master.

Upon the political works of the new reign we shall enter no further than may be necessary to illustrate the character of this princess. She exhibited some anxiety for the recal of M. de Choiseul; but this was over-ruled by the king's prejudices against him, and the young queen was severely lectured by the abbé de Vermont, for venturing to communicate her sentiments on such a subject to M. Campan. The king, on the other hand, scarcely ever deigned to communicate with the abbé. Marie Antoinette first became unpopular, it is said, by her carelessness of the long-established etiquette of the court; a species of restraint which the buoyancy of her spirits and the simplicity of her taste conjoined to make intolerable to her.

She enjoyed every species of natural and innocent recreation, abridged or abolished every burdensome formality that was imposed on her, and was the warm advocate for 'simplicity beneath the diadem, and paternal confidence in her subjects.' But her smiling at the childish pranks of one of her women on the first of her court-days, was pronounced to be deriding the respectable persons that were pressing forward to pay her homage; the epithet moquesque was freely applied to her; and, more than fifteen years after, Madame Campan heard some old ladies in Auvergne attribute the beginning of her misfortunes to this unpardonable error. She had the credit, however, at this time, of being the only person in the royal family who was said to have given the king and his brothers the 'rash advice' to be inoculated. The operation, then unusual in France, was performed by a Dr. Jauberthou, and was quite successful.

The toilette of a queen of France had become a master-piece of etiquette; every thing was to be performed by official persons, and in a prescribed manner. The effect was sometimes ludicrously inconvenient. A dame d'honneur and the tire-women usually attended, assisted by the principal lady in waiting and two inferior women. But if a princess of the royal family made her appearance during the important procedure of attiring the queen, the honors of the service were to be transferred to her through the medium of the chief lady in waiting; and if one of higher rank than the first appeared, to her again were the honors transferred.

'One winter's day,' says our authoress, 'it happened that the queen, who was entirely undressed, was just going to put on her body linen; I held it ready unfolded for her; the dame d'honneur came in, slipped off her gloves, and took it. A rustling was heard at the door, it was opened: and in came the duchess d'Orleans; she took her gloves off, and came forward to

take the garment; but as it would have been wrong in the dame d'honneur to hand it to her, she gave it to me, and I handed it to the princess: a further noise—it was the countess de Provence; the duchess d'Orleans handed her the linen. All this while the queen kept her arms crossed upon her bosom, and appeared to feel cold: Madame observed her uncomfortable situation, and merely laying down her handkerchief, without taking off her gloves, she put on the linen, and in doing so, knocked the queen's cap off. The queen laughed to conceal her impatience, but not until she had muttered several times: 'How disagreeable! how tiresome!'

The queen naturally led the fashions of the day, and made it an occupation of no small moment at the commencement of her reign. She in particular introduced head-dresses, that superstructure of gauze, feathers, and flowers, which obtained so great a degree of altitude in the times of our good aunts and mothers, so that in Paris the ladies could with difficulty find carriages high enough to admit them; and they were often seen stooping, kneeling, and even holding their heads out of the windows, to manage these splendid incumbrances without danger. One of the customs most disagreeable to her at court, was that which required the royal family to dine every day in public. She submitted to it only while she was dauphiness. On the day of the coronation of the young king and queen at Rheims, it is said that the former put his hand to his head at the moment of the crown being placed upon it, and said, 'It pinches me.'

Soon after this event she was called upon to attend in the chamber of the countess d'Artois to witness the birth of a young prince, an event at which all the royal family of France were expected to be present. It is said, as connected with her own peculiar situation, to have produced feelings of the most poignant anguish in her mind. In the winter of 1776 she first became acquainted with the princess de Lamballe, whose heroic attachment to her, and tragical fate, will ever rank amongst the most interesting and striking events of the French revolution, and for whom she revived the office of 'superintendant' of the queen's household.

Against the character and happiness of Marie Antoinette intrigue was always silently at work. Shortly after the accession of Louis XVI. the minister of the king's household was informed that a most offensive libel against the queen was about to appear. The lieutenant of police deputed a man named Goupil, an inspector of police, to bring to light this libel: he came, soon after, to say that he had found out the place where the work was being printed, and that it was at a country-house near Yverdun. He had already got possession of two sheets, which contained calumnies the most atrocious, but conveyed with a degree of art which might make them very dangerous to the queen's reputation. This Goupil said that he could obtain the rest, but that he should want a considerable sum for that purpose. Three thousand louis were given him, and very soon afterwards he brought the whole manuscript, and all that had been printed, to the lieutenant of police. He received a thousand louis more as a reward for his address and zeal; and a much more important office was about to be given to him, when another spy, envious of Goupil's good fortune, gave information that Goupil himself was the author of the libel; that, ten years before, he had been put into the Bicetre for theft; and that madame Goupil had only been three years out of the Salpetriere, where she had been placed under another name.

Another woman, named Cahouette de Villers, whose husband held the office of one of the treasurers of France, being very irregular in conduct, and of a scheming turn of mind, conceived the mad wish to appear in the eyes of her friends at Paris, as a person in favor at court, to which she was not entitled either by birth or office. She adopted, as her lover, Gabriel de Saint Charles, intendant of her majesty's finances, and easily procured, through his means, patents and orders signed by her majesty: she then set about imitating her writing, and composed a great number of notes and letters, as if written by her majesty, in the tenderest and most familiar style. For several months she showed them as great secrets to several of her particular friends. Afterwards she made the queen appear to write to her as before, to procure her various fancy articles. Under the pretext of wishing to execute her majesty's commissions faithfully she gave these letters to the tradesmen to read; and succeeded in having it said, in several houses, that the queen had a particular kindness for her. She then enlarged her scheme, and represented the queen as desiring her to borrow 200,000 francs, which she had need of, but which she did not wish to ask of the king from his private funds. This letter being shown to M. Beranger, farmer-general, took effect; he thought himself fortunate in being able to render this assistance to his sovereign, and lost no time in sending the 200,000 francs to madame de Villers. This first step was followed by some doubts, which he communicated to people better informed than himself, of what was passing at court, and who added to his uneasiness; he then went to M. de Sartine, who unravelled the whole plot. The woman was sent to Saint Pelagie; and the unfortunate husband was ruined, by replacing the sum borrowed, and paying for the jewels fraudulently purchased in the queen's name.

In 1777 the celebrated countess de Polignac first appeared at court, and at once attracted the admiration, and won the heart of the queen. She was personally of a retiring character, and of narrow fortune: had merely natural talents; no presumption, or display; and no affectation of knowledge. M. de Campan, who was somewhat of a judge, says, 'she had not one of the failings which usually accompany the title of a favorite? In her society Marie Antoinette appears to have made severe efforts to enjoy a real and personal friendship. 'I will enjoy,' said she, 'the comforts of private life, which exist not for us, unless we have the resolution to secure them for ourselves.' This cherished friend succeeded, in a short time, to the post of governor of the children of France; and the duke her hus

band, became superintendant of the post and first squerry of the queen.

Marie Antoinette was never a distinguished patron of literature, or of the fine arts generally; her own education had been neglected, and she naturally wished to hide its defects. But, at one period, she was the successful encourager of musical compositions; and the first company of comic actors in Paris was collected to gratify her taste. This brought to the capital, in succession, Gluck, Piccini, and Sacchini. From 1775 to 1781, says her biographer, she passed the pleasantest part of her life, and that in which she indulged most in the gratifications presented to her. Among these was the visit of her brother the emperor Joseph II., who arrived at Paris in 1779, under the title of count Falkenstein. But his manners were any thing but agreeable to the court of France generally, or to the king. He refused an apartment at the palace; his valet, he said, had made up his camp-bed in a ready-furnished house, and there he would lodge. To the queen's occasional mortification he made extremely free observations on all around him; remonstrated with the king on his ignorance of what was passing in Paris, especially as a repository of art; for not having visited the hotel des Invalids, the military school, &c. It is quite clear that his good brother-in-law entered but too correctly into the defects of this amiable but weak monarch. Of his sister he said publicly, at the Italian theatre,—'Your young queen is very giddy; but luckily you Frenchmen have no great objection to that.'

At length the queen became pregnant; and on the 11th December, 1778, gave birth to Madame, the king's daughter. The picture of the state-room, in which the queen of France at this time became a mother, we must subjoin from the pen of her 'first woman.' The royal family, princes of the blood, and great officers of state, passed the night in the rooms adjoining the queen's bed-chamber. Madame, the king's daughter, came into the world before mid-day on the 19th of December. The etiquette of allowing all persons indiscriminately to enter at the moment of the delivery of a queen, was observed so literally, that at the instant when the accoucheur, Vermond, said aloud, *La reine va s'accoucher*, the torrents of inquisitive persons who poured into the chamber were so great and tumultuous, that the rush was near destroying the queen. During the night the king had taken the precaution to have the enormous tapestry screens, which surrounded her majesty's bed, secured with cords: had it not been for this foresight they certainly would have been thrown down upon her. It was impossible to move about the chamber, which was filled with so motley a crowd that any one might have fancied himself in some place of public amusement. Two Savoyards got upon the furniture to get a better sight of the queen, who was placed opposite the fire-place, upon a bed prepared for the moment of delivery. The noise, and the sex of the infant, which the queen was made acquainted with by a signal previously agreed on, as it is said, with the princess de Lamballe, or some error of the accoucheur, brought on symptoms which threatened the most fatal consequences.

Nature seems at last to have triumphed in the heart of the king. He became a lover after having been nine years a husband; and occupied himself with the care of preserving his wife. A pretty little madrigal has been preserved on the birth of this princess, who was not of course quite so welcome at court as a son would have been:

A dauphin we asked of our queen,
A princess announces him near;
Since one of the Graces is seen,
Young Cupid will quickly appear.

One hundred maidens of Paris were portioned and married on this occasion at Notre Dame. In the close of 1780 the queen of France received the tidings of her mother's decease, for whose memory she seems to have cherished the highest veneration. She soon testified the regret she felt in thinking that the numerous duties of that august parent had prevented her watching in person over the education of her daughters; and modestly said that she herself should have been more worthy of her station if she had had the good fortune to receive lessons directly from a sovereign so enlightened.

On the 22d of October, 1781, the queen gave birth to a dauphin, a circumstance which elated the king to unusual animation. The duke d'Angouleme meeting his father at the entrance of the Dauphin's apartment said to him 'O papa, how little my cousin is!' 'The day will come when you will think him great enough, my dear,' answered the prince. One honest poet wrote on this occasion:

This infant prince our hopes are center'd in,
Will, doubtless, make us happy, rich, and free;
And since with *somebody* he must begin,
My fervent pray'r is—that it may be me!

At Petit Trianon, a palace presented to her soon after the accession of the king to the throne, Marie Antoinette adopted with enthusiasm a country life. She traversed the neighbourhood in a plain white gown, straw hat, and gauze kerchief, her favorite dress; seeing the neighbouring manufactories at work, the cows milked, or fishing in the lake, were her pleasures; and every year she showed an increasing aversion to the more pompous excursions to Marly until the latter were wholly discontinued. At Trianon she could enter the sitting-room without driving the ladies either from their music or embroidery, and gentlemen would continue their billiards or backgammon. The place was too small for either her ladies of honor, or of the bed-chamber, to have accommodations in it; they therefore repaired to her, on her requisition for Versailles, whither the king came also to her every night to sup. Here she soon established a private theatre, in which the royal family were the performers and only spectators.

The period of the birth of the dauphin was distinguished by the application of the American deputies to the court of France for assistance. La Fayette, and many other young soldiers and ardent lovers of liberty, it is well known, warmly

espoused their cause; but the queen and probably the king, personally, viewed their character and manners with considerable distaste. Madame Campan says of Franklin,—his strait unpowdered hair, his round hat, his brown cloth coat, formed a contrast with the laced and embroidered coats and the powdered and perfumed heads of the courtiers of Versailles. This novelty turned the enthusiastic heads of the French women. Elegant entertainments were given to doctor Franklin, who, to the reputation of a most skilful philosopher, added the patriotic virtues which had invested him with the noble character of an apostle of liberty. I was present at one of these entertainments, when the most beautiful woman out of three hundred was selected to place a crown of laurels upon the white head of the American philosopher, and two kisses upon his cheeks. Even in the palace of Versailles, Franklin's medallion was sold under the king's eyes, in the exhibition of Sevres porcelain.

The queen spoke out plainly as to the ungenerous attack the French were now induced to make on the power of England. In 1782 the Russian grand duke Constantine (afterwards Paul I.) and his consort appeared at the court of France as the count and countess de Nord; and about the same time came the king of Sweden. The queen of France remarked how much more difficult it was to play the sovereign amongst sovereigns, or of princes born to become so than before courtiers on ordinary occasions. A series of splendid entertainments were given to these distinguished guests. In 1783, on the peace with England, France attained a height of political consequence which she never afterwards reached during this unfortunate reign; and the winter was an extremely brilliant one at court. The navy as well as the army of France had assumed an imposing attitude; and, in assisting to wrest from Great Britain her colonies, had crippled that power which alone had withstood successfully the ambitious views of Louis XIV. The Bourbon family had every prospect of a numerous and long-continued succession: but the seeds of the Revolution were already germinating, the finances were disordered, and the court was agitated to its centre by the appearance of a comedy and the alleged indiscretions of the queen.

The reputation of Beaumarchais, since the introduction of his Barber of Seville, had become most distinguished; and his Memoirs against M. Goesman had covered with ridicule a parliament which was everywhere detested. He now attempted a higher flight, and became ambitious of the reputation of giving an impulse to the minds of the Parisians by a drama in which the most ancient and respected institutions should be held up to derision. The new philosophers had prepared the minds of the French for the strange mixture of criticism and sarcasm now produced; so that when his Marriage of Figaro was completed, crowds of respectable persons thronged to hear it read. The people were universally anxious to see it performed: but the police would not license it. One of its most remarkable phrases, 'None but little minds dread little books,' induced many to appear indifferent to its censures; and the king determined to have it privately read to him. For this task Madame Campan was selected.

I began—the king frequently interrupted me by remarks, which were always just, either of praise or censure. He frequently exclaimed, 'That's in bad taste; this man continually brings the Italian concetti on the stage.' At that soliloquy of Figaro, in which he attacks various points of government, but aims most particularly at state-prisons, the king rose up, and said indignantly, 'That's detestable; that shall never be played: the Bastile must be destroyed, before the licence to act this play can be any other than an act of the most dangerous folly. This man scoffs at every thing that is to be respected in a government.' Surely the king here gave a decision to which experience must have reconciled all the enthusiastic admirers of the whimsical production in question. 'It will not be played, then?' said the queen. 'No, certainly,' replied Louis XVI.; 'you may rely upon that.'

The piece was attempted to be performed privately at the theatre of the Hotel des Menus-Plaisir; but the king, on the morning of the day fixed, signed a lettre de cachet prohibiting this. The wits of Paris were in an uproar; public liberty, according to the political part of them, was attacked. When the author gave out that the passages offensive to government were suppressed, and M. de Vandreil a friend of the duchess de Polignac, under color of wishing to judge of this, obtained permission for the persecuted piece to be performed at his country-house. There was no material omission; but the author's friends avowed that there was: and the court was weak enough to be cajoled into a permission for its public performance; and the audience enthusiastically applauded it.

Shortly after this the character of the queen was involved in the celebrated affair of the necklace, purchased by cardinal de Rochan. This prince had been ambassador at Vienna, whence he was recalled for his profligate conduct, and being out of favor at court was the easy dupe of a Mad. Lamotte in a pretended method of obliging the queen. Boehmer, her majesty's jeweller, had been for some time collecting a diamond necklace, which he proposed to sell the queen for 1,600,000 francs. He had entreated her personally to take it, and the king wished to present it to her; but Marie Antoinette appears steadily to have refused it from principles of economy. Madame Lamotte went to the cardinal, and told him that the queen had recently a strong desire for this jewel; that she wished to pay for it by instalments out of her savings; and would afford the prince a proof of her returning good will, by commissioning him to make a bargain for it in her name She produced a forged order to this effect, signed Marie Antoinette de France; the necklace was purchased, and taken to the house of Lamotte at Versailles, where a messenger from the queen was to meet and receive it. The cardinal took it himself; and a man in the habit and resembling the person of the queen's confidential valet de chambre received it of him. When the first instalment was

becoming due, Lamotte pretended that the queen became anxious because she was not quite sure of the means of paying it, introduced a money-lender to the cardinal, to whom the queen's order was shown, and the plot thus thickened. A new order was procured for this M. A. James to advance the money for the queen; but the most audacious part of this woman's scheme was, the obtaining a Parisian actress, Mad. d'Oliva, to personate the queen to the cardinal, and give him a meeting in her name in the groves of Versailles.

The cardinal, Lamotte, and her husband, it is well known, were brought to trial for this strange business, when de Rohan was acquitted, Lamotte condemned to be whipped, branded, and imprisoned for life, and her husband sent to the galleys. The queen was exceedingly indignant that the cardinal should so easily escape.

Marie Antoinette first concerned herself in public affairs when the archbishop of Sens came into the ministry. He was the friend of her long-cherished tutor de Vermont; and their instigation, connected with the imbecility of the king, gradually brought her to the vortex, so fatal finally to her character and life. She frequently regretted her new situation, Mad. Campan assures us, and looked upon it as a misfortune which she could not avoid. 'There is an end of all happiness for me,' she said one day 'since they have made an intriguer of me.' When the assemblies of the notables had proved so fruitless, and, combined with the distracted state of the parliament, had induced the necessity of calling together the states-general, it was much discussed at court whether Versailles, or some more distant spot forty or sixty leagues from the capital, should be the place of meeting. The queen advocated the latter; but M. Neckar's opinion prevented, and Versailles was fixed upon. At the opening of the states-general, Marie Antoinette appeared for the last time in her life in regal state; but was ill-received by the people. Deputies from the Tiers-etat soon arrived to inspect the court-establishments: the most absurd prejudices seemed to fill their minds, and they returned astonished at the plainness of all the queen's apartments, it is said, particularly those of her retreat at Trianon. On the fourth of June, 1789, died the first dauphin, a prince who never enjoyed good health, and with a precocious mind united a lame and weak person. The insurrections of the eleventh, twelfth, and fourteenth of July this year soon opened the revolutionary drama; and, while the whole monarchical authority was becoming gradually undermined, the popular odium was more particularly directed against the queen and the count d'Artois, now Charles the tenth. This prince is said to have shed bitter tears on the assassination of M. Launay. On the evening of the fifteenth, the populace having demanded to see the queen and her son in the balcony of the Thuilleries, Mad. Campan mingled in the crowd in the court-yard, when a woman whose face was covered with a black veil seized her by the arm with violence and said, 'I know you very well; tell your queen not to meddle with government any longer; let her leave her husband and our good states-general to work out the happiness of the people.' At the same moment a person dressed as a market-man, with his hat pulled over his eyes, seized her by the other arm and said, 'Yes, yes; tell her over and over again that it will not be with these states as with the others, which produced no good to the people; that the nation is too enlightened in 1789 not to make something more of them: and that there will not now be seen a deputy of the Tiers-etat making a speech with one knee on the ground; tell her this, do you hear?' I was struck with dread; the queen then appeared in the balcony. 'Ah!' said the woman in the veil, 'the duchess is not with her.' 'No,' replied the man, 'but she is still at Versailles: she is working under ground, mole-like; but we shall know how to dig her out.' The detestable pair moved away from me, and I re-entered the palace scarcely able to support myself. I thought it my duty to relate the dialogue of these two strangers to the queen, who made me repeat the particulars of it to the king.

Another of the people exclaimed under the windows of the throne-room, 'Here is that crown, the vestiges of which will soon be sought for in vain.' On the 16th it was first agitated whether the king and royal family should not at once depart from the scene of the rising storm with the army, which, in a spirit of extreme forbearance, he had ordered to quit Paris. The queen warmly controverted this measure, but was over-ruled, and received the orders for packing up with haste. Her friend, the duchess de Polignac, emigrated with her family the evening of this memorable day. The next day, on the king's going to Paris from Versailles, the queen shut herself up in the room, and declared her firm opinion that he never would return. With a dignity that never forsook her, she prepared for this event, and wrote a short address to the assembly, to which she, in that case, meant to have repaired. The king did return in the evening. 'Happily,' said he, 'no blood has been shed; and I swear that never shall a drop of French blood be spilt by my order:' a determination he but too rigidly fulfilled. The reader may remember that this unhappy monarch only appeased his enemies this day by placing the tri-colored cockade in his hat; on which Baily, the mayor of Paris, observed, 'Henry the Fourth conquered his people, and here are the people conquering the king.' A few days after this M. Foulon, an ardent loyalist, was assassinated at the hotel de Ville, within the hearing of the Assembly; his body dragged about the streets, and his heart carried by women in the midst of a bunch of white carnations. At about this date the queen was compelled by the jealousies he excited in the ruling party, to dismiss her old favourite the abbé Vermont.

In the course of July the regiment of French guards in attendance upon the king at Versailles, abandoned its colors, joining the national guard at Paris, so that the royal family rising in the morning found no guard whatever at any of the posts. In August and September the basis of a new limited monarchy was agreed upon, which it was conceived would secure the public tran-

quillity; but the early part of October dissipated this illusion. The pretext was, a scarcity of bread; but the friends of the royal family regarded the insurrection of the fifth and sixth as directed against the queen in particular. 'I shudder even now,' says Madam Campan, 'at the recollection of the poissardes, or rather furies, who wore white aprons, which they screamed out were intended to receive the bowels of Marie Antoinette, and that they would make cockades of them; mixing the most obscene expressions with these horrible threats; such are the atrocious sentiments with which the ignorance and cruelty to be found in the mass of every populace can inspire them in times of disturbance! so necessary is it that a vigorous and parental authority should, while it defends good citizens against their own failings, also guard them against all the calamities brought on by faction.

The queen went to bed at two in the morning, and went to sleep, being tired out with the events of so distressing a day. She ordered her two women to go to bed, always imagining there was nothing to dread, at least for that night; but the unfortunate princess was indebted for her life to that feeling of attachment which prevented their obeying her. My sister, who was one of the two ladies in question, informed me the next day of all that I am about to relate.

On leaving the queen's bed-chamber, these ladies called their femmes de chambre, and all the four remained sitting together against her majesty's bed-room door. About half-past four in the morning they heard horrible yells and discharges of fire-arms; one ran in to the queen to awaken her and get her out of bed; my sister flew to the place from which the tumult seemed to proceed; she opened the door of the anti-chamber which leads to the great guard-room, and beheld one of the body-guard holding his musket across the door, and attacked by a mob, who were striking at him; his face was covered with blood; he turned round and exclaimed, Save the queen, madame; they are come to assassinate her. She hastily shut the door upon the unfortunate victim of duty, fastened it with the great bolt, and took the same precaution on leaving the next room; on reaching the queen's chamber, she cried out to her, get up, madame; don't stay to dress yourself; fly to the king's apartment. The terrified queen threw herself out of bed, they put a petticoat upon her without tying it, and the two ladies conducted her to the bull's eye. A door which led from the queen's toilet-closet to that apartment had never before been fastened but on her side. What a dreadful moment! it was found to be secured on the other side. They knocked repeatedly with all their strength; a servant of one of the king's valets de chambre came and opened it: the queen entered the king's chamber, but he was not there. Alarmed for the queen's life, he had gone down the staircase and through the corridors under the bull's eye, by means of which he was accustomed to go to the queen's apartments, without being under the necessity of crossing that room. He entered her majesty's room, and found no one there but some body-guards, who had taken refuge in it. The king, unwilling to expose their lives, told them to wait a few minutes, and afterwards sent to desire them to go to the bull's eye. Madame de Tourzel, at that time governess of the children of France, had just taken Madame and the Dauphin to the king's apartments. The queen saw her children again. The reader must imagine this scene of tenderness and despair.

It is not true that the assassins penetrated to the queen's chamber and pierced the bed with their swords. The fugitive body-guards were the only persons who entered it; and if the crowd had reached so far they would all have been massacred. Besides, when the rebels had forced the doors of the anti-chamber, the footmen and officers on duty, knowing that the queen was no longer in her apartments, told them so, with that air of truth which always carries conviction. The abandoned horde instantly rushed towards the bull's eye, hoping, no doubt, to intercept her on her way.

In the morning the mob insisted that the king and royal family should accompany them to Paris. La Fayette, at the head of the Parisian guard, commanded this memorable procession, in the midst of which the heads of two of the king's body-guards, who had been murdered, were carried upon poles. The poissardes exclaimed, 'We shall have bread now! we have the baker, the baker's wife, and the baker's boy with us.' The royal family were taken to the hotel de ville, and then to the Thuilleries, where they had a guard appointed over them; but the Assembly and the mob alike affected to wish that they should consider themselves free; and the political schemes that now occupied the National Assembly and the king, afforded them some personal quiet. The queen resumed her usual habits. Her mornings were employed in superintending the education of Madame, and she began to work large pieces of tapestry, finding her needle rather than any books the best employment to divert her mind. Twice a week she received the court, and on those days dined in public with the king; but she had no concert and did not go to the play till after the acceptation of the constitution in 1791.

Various plans of escape were secretly offered to the royal family during this and the preceding year; and every insult was added to the injuries that could stimulate them to attempt it. Some 'conquerors of the Bastile,' as they were called, preceded by military music, came to present the Dauphin a new year's gift at the beginning of 1791. It was a box of dominos made of the stone and marble of that fortress, and inscribed on the lid, 'Stones from those walls which enclosed the victims of arbitrary power converted into a toy, and presented to you, Monseigneur, as a homage of the people's love, and to teach you the extent of their power.' Madames, the king's aunts, set out from Bellevue at this time for Rome. It was an event that created some sensation, and was designed to sound the public mind as to a projected departure of the king. This was at last attempted on the 20th of June, but nothing was ever more injudiciously managed. The preparations for it were made without caution; and, while extensive

in trifling matters, did not even include a sound carriage for the king and queen. The beginning of the journey presented nothing remarkable; but, at about twelve leagues from Paris the king's carriage required repairing, and this, with his majesty's determination to walk up some hills, detained the travellers three hours beyond the time at which they were to have been met by an escort near Varennes. At St. Menchould this unfortunate prince looked out of the carriage and was recognised by the post-master from his resemblance to the impression of his head upon the assignats. This person rode forward and carried the tidings to Varennes the next post town. The royal party, therefore, found the town-guard called out, and the bridges blocked up with carts. But the king's escort had arrived here before him, and the commandant asked the king whether he chose to effect a passage by force? 'Would it be a brisk action?' asked his majesty. 'It is impossible to prevent it, sire,' said M. Goguelat. The king now, therefore alighted, steadily declining to force his way, and entered into a fruitless explanation of his motives with the mayor of the place, a grocer: while, such was the humiliation of royalty on this occasion, the queen seated herself among parcels of soap and candles at the end of the shop, and endeavoured to prevail with his wife to favor their escape. 'Bless me, Madame,' said this good lady, 'it would be the destruction of M. Sauce. I love my king; but by our lady I love my husband too, you must know: and he would be answerable, do you see.' Soon arrived from Paris the aid de camp of La Fayette in pursuit of the fugitives, who were hastened back; their three body-guards being bound and fastened upon the seat of the carriage.

They were for some time kept such close prisoners that guards were placed inside the door of the queen's bed-chamber. 'The first time I saw her majesty,' says madame Campan, 'after Varennes journey, I found her getting out of bed; her features were not very much altered, but, after the first kind words she uttered to me, she took off her cap, and desired me to observe the effect which grief had produced upon her hair. It became in one single night as white as that of a woman of seventy. Her majesty showed me a ring she had just had mounted for the princess de Lamballe; it contained a lock of her whitened hair, with the inscription—bleached by sorrow!'

We cannot pursue the details of the new indignities offered to this unhappy family on their return; yet the attempted flight produced on the whole less sensation at Paris than might have been expected. The Assembly proceeded in new modelling the constitution. On the 14th of September, at mid-day, the king accepted it in the midst of the National Assembly, accompanied by the queen. She acutely observed on the occasion, 'These people will shortly have no sovereign; we shall fall before their treacherous and well-formed tactics! They are demolishing the monarchy stone by stone.' There was, however, now some faint prospect of future tranquillity. Paris and the Thuilleries were magnificently illuminated. Their majesties went to the opera and were highly applauded.

At the latter end of the year 1791 the king and queen had reason to entertain such serious apprehensions of being poisoned, that all their food passed for a time through the hands of Madame Campan, who procured it from various parts of Paris, and contrived that neither of her royal patrons should eat or drink that which the other servants had prepared for them. About Easter 1792 Dumouriez obtained an interview with the queen, offering to abandon the Jacobins and devote himself to her service. She appears, however, to have doubted his sincerity. On the 20th of June the mob once more broke, in overwhelming numbers, into the royal apartments, and rushed towards that of the king. His life was only saved by his being placed in a recess of the window with benches before him. The queen was in like manner preserved by being placed with the dauphin behind a great table: but the poor little prince, as well as the king, was obliged to place on his head an enormous bonnet rouge. After this the queen occupied herself with constructing a breastplate for the king. It was formed of 15 folds of Italian taffety, which were found to resist all thrusts of a dagger, and even to turn a pistol ball. Madame Campan, in July, never went to bed; and one morning, at one o'clock, overheard the scuffle between an assassin and the queen's valet de chambre; the former having approached the door of her majesty's chamber. On another occasion, the poor queen reproved her attendants for not having called her in the night, when the king and other branches of the family had been alarmed. Madame Campan excused herself, saying, that she required to have her strength recruited. 'It is not diminished,' said the queen nobly, 'misfortune gives us additional strength. Elizabeth was with the king, and I was asleep; I, who am determined to perish by his side. I am his wife; I will not suffer him to incur the smallest risk without my sharing it.' At length arrived the memorable 10th of August, when possession of the Thuilleries was regularly contested between the mob and the Swiss guards, who were almost all cut to pieces. Two hundred of the old nobless also nobly fell on this occasion in defence of the royal family. The result is well known. The king, queen, and their family, were obliged to fly to the hall of the National Assembly. The stairs, apartments, and every part of the Thuilleries, streamed with blood. This was in fact the final overthrow of a throne that had been established for eleven centuries. The National Assembly was as inadequate, as many of its members were unwilling, to support the king. The cannon of the Paris mob dictated its decrees. Louis was now therefore suspended from his functions, and transferred with his family as prisoners to the Temple. The massacres of September followed, during which prisoners were taken one by one from their confinement, tried before a mock jury of the mob, and despatched. Among the rest the amiable Princess de Lamballe was thus massacred, and, being the well-known friend of Marie Antoinette, her head was exhibited under the windows of the Temple, that it might meet the eyes of the unhappy queen. On the 11th of December the king took his mock

trial. See the article Louis XVIth. But the French nation was to disgrace itself by an act of still greater barbarity than the murder of this amiable prince. His faithful and innocent queen was destined to follow him to the scaffold. She had been removed from the Temple on the 1st of August 1793, to a miserable apartment in the prison of the Conciergerie, and was brought before the revolutionary tribunal on the 15th of October. The accusations against her were some of them so infamous, and all of them so absurd, as to be wholly unworthy of detail. Her judges had long before her mock-trial decided upon her death; which she met with a noble and elevated dignity, in the Place de la Revolution on the following day.

ANTOING, a market town and barony of Hainault, in the Netherlands, with an old castle, situated on the Scheldt, five miles from Tournay. Population 1600. At the adjoining village of Fontenoy, the allies under the duke of Cumberland and count Konigsegg fought the well-known battle of that name with the French under marshal Saxe.

ANTON, a town of Peru, lying between the rivers Choru and Colorado, which abounds in provisions with which it supplies the city of Panama.

ANTONA, a river of Britain, mentioned by Tacitus, which Camden supposes to be a faulty reading for Avuona, or Ausuona, the Avon.

ANTONGIL, a large bay in the island of Madagascar, which is safe and commodious for ships.

ANTONIA, daughter of Mark Antony and Octavia, equally virtuous, but equally unfortunate with her mother. While young, she was married to Drusus, brother of Tiberius, who died on his return from Germany to receive a triumph for his victories. Disconsolate at her loss, Antonia would never enter into a second marriage, but devoted herself to the education of her three children. The death of her son Germanicus, from the jealousy of Tiberius, and the ill conduct of her younger son Claudius, and her daughter Livilla, were sources of new misery to her. She died at Rome in the reign of her grandson, the infamous Caligula.

Antonia, a citadel of Jerusalem. Hyrcanus, the first high-priest of that name, built, near the temple, a house with turrets, where he generally resided. Herod afterwards fortified it for the security and defence of the temple; and in honor of Mark Antony, who then commanded in the east, called it Antonia.

Antonin, St. a town of France, in the department of the Torn, whose fortifications are demolished. It is seated on the river Aveiron.

ANTONIANO (Silvio), professor of belles lettres at Rome, was born there, of low parentage, in 1540. The duke de Ferrara coming to congratulate Marcellus II. upon his being raised to the pontificate, was charmed with the genius of Antoniano while yet a youth, and provided able masters to instruct him in the sciences at Ferrara. From thence he was sent for by Pius IV., who made him successively professor of belles lettres, and rector of the Sacred college. After the death of Pius IV. he joined himself to Philip Neri, and accepted the office of secretary to the college, which he executed for twenty-five years with great reputation. He refused a bishopric from Gregory XIV., but Clement VIII. made him his chamberlain, and afterwards a cardinal. He died in his sixty-fourth year. He wrote, it is said, with such ease and fluency, that he never made an erasure.

ANTONIAN Water, in the materia medica, a mineral water of Germany, composed of calcareous earth, carbonated soda, and common salt.

ANTONINA, the wife of Belisarius, who not only repeatedly dishonored her husband by her infidelities, but persecuted her own son Photius, with the utmost virulence, because he had discovered her intrigues, and revealed them to his injured stepfather. In the language of Mr. Gibbon, who gives her history in his Decline and Fall of the Roman Empire, 'she was, in the various situations of fortune, the companion, the enemy, the servant, and the favorite of the empress Theodora,' a woman as wicked and worthless as herself. 'These loose and ambitious females,' adds Gibbon, 'had been connected by similar pleasures, they were separated by the jealousy of vice, and at length reconciled by the partnership of guilt.'

ANTONINUS (Aurelius Fulvius), surnamed Pius, the Roman emperor, was born at Lanuvium in Italy, A. D. 86, of a family originally from Nismes in Languedoc. His character was in all respects one of the noblest that can be imagined; and he had the title of Pius given him by the senate. We have no regular account of the transactions of his reign, as Capitolinus has written in a very confused manner; and we have only an abridgement of Dion Cassius's history by Xiphilin now remaining. He managed the public revenues with great frugality, yet was extremely generous; was fond of peace, and in war preferred the reputation of justice to all the advantages which might be gained by victory. He was more intent upon preserving the bounds of his empire than extending them; and he often made use of Scipio's expression, that he chose rather to save one citizen than kill a thousand enemies. By this conduct he made himself universally esteemed and revered in that age, and admired by posterity. This great and good emperor died in 161, aged seventy-five, having reigned twenty-three years.

Antoninus (Marcus Aurelius), surnamed the philosopher, the Roman emperor, born at Rome the 26th of April, A. D. 121. He was called by several names till he was admitted into the Aurelian family, when he took that of Marcus Aurelius Antoninus. Adrian, upon the death of Cejonius Commodus, turned his eyes upon Marcus Aurelius; but, as he was not then eighteen years of age, and consequently too young for so important a station, he fixed upon Antoninus Pius, whom he adopted upon condi-

ion that he should likewise adopt Marcus Aurelius. The year after this adoption Adrian appointed him questor, though he had not yet attained the age prescribed by the laws. After the death of Adrian, Aurelius married Faustina, the daughter of Antoninus Pius, by whom he had several children. In the year 139 he was invested with new honors by the emperor, in which he behaved in such a manner as endeared him to that prince and the whole people. Upon the death of Pius, which happened in 161, he was obliged by the senate to take upon him the government; in the management of which he took Lucius Verus as his colleague. Dion Cassius says, that the reason of doing this was, that he might have leisure to pursue his studies, and on account of his ill state of health; Lucius being of a strong vigorous constitution, and consequently more fit for the fatigues of war. The same day he took upon him the name of Antoninus, which he gave likewise to Verus his colleague, and betrothed his daughter Lucilla to him. The two emperors went afterwards to the camp, where, after having performed the funeral ntes of Pius, they pronounced each of them a panegyric to his memory. They discharged the government in a very amicable manner. It is said, that soon after Antoninus had performed the apotheosis of Pius, petitions were presented to him by the Pagan priests, philosophers, and governors of provinces, in order to excite him to persecute the Christians; which he rejected with ndignation and interposed his authority for heir protection by writing a letter to the common assembly of Asia, then held at Ephesus. Eusebius has preserved a copy of this letter, list. Ecc. lib. iv. c. 13, which he ascribes by mistake to Antoninus Pius. The happiness which the empire began to enjoy under these wo emperors, was interrupted in the year 162 y a dreadful inundation of the Tiber, which estroyed a vast number of cattle, and occasioned a famine at Rome. This calamity was followed by the Parthian war; and at the same me the Catti ravaged Germany and Rhætia. ucius Verus went in person to oppose the arthians; and Antoninus continued at Rome, here his presence was necessary. During this ar with the Parthians, about the year 163 or 4, Antoninus sent his daughter Lucilla to erus, she having been betrothed to him in marge, and attended her as far as Brandusium: intended to have conducted her to Syria; t, it having been insinuated by some persons, at his design of going into the east was to im the honor of having finished the Parthian r, he returned to Rome. The Romans hav gained a victory over the Parthians, who re obliged to abandon Mesopotamia, the two perors triumphed over them at Rome in 166; were honored with the title of fathers of ir country. This year was fatal on account of a rible pestilence, which spread itself over the ole world, and a famine under which Rome ored; it was in this year that the Marconni, and many other people of Germany, took arms against the Romans; but the two emrors, having marched in person against them, iged the Germans to sue for peace. The war, however, was renewed the year following, and the two emperors marched again in person; but Lucius Verus was seized with an apoplectic fit, and died at Altinum. The Romans were now defeated with great slaughter; and the emperor not choosing to burden his subjects with new taxes, exposed to public sale the furniture of the palace, the gold and silver plate belonging to the crown, his wife's splendid garments embroidered with gold, and a curious collection of pearls which Adrian had purchased during his long progress through the provinces of the empire, and was called Adrian's cabinet. In 170 Antoninus made vast preparations against the Germans, and carried on the war with great vigor. During this war, in 174, a very extraordinary event is said to have happened, which, according to Dion Cassius, was as follows:—Antoninus's army being blocked up by the Quadi, in a very disadvantageous place, where there was no possibility of procuring water; in this situation, being worn out with fatigue and wounds, oppressed with heat and thirst, and incapable of retiring or engaging the enemy, in an instant the sky was covered with clouds, and there fell a vast quantity of rain. The Roman army were about to quench their thirst, when the enemy came upon them with such fury, that they must certainly have been defeated, had it not been for a shower of hail, accompanied with a storm of thunder and lightning, which fell upon the enemy without the least annoyance to the Romans, who by this means gained the victory. The Pagans as well as Christians have acknowledged the truth of this prodigy, but have greatly differed as to the cause of such a miraculous event; the former ascribing it to magicians. On Antoninus's pillar the glory is ascribed to Jupiter the god of rain and thunder. But the Christians affirmed, that God granted this favor at the prayer of the Christian soldiers in the Roman army, who are said to have composed the twelfth legion; and, as a mark of distinction, we are told that they received the title of the Thundering Legion, from Antoninus. Euseb. Eccles. Hist. lib. v. cap. 5. Mr. Moyle, in the letters published in the second volume of his works, has endeavoured to explode this story of the Thundering Legion; which occasioned Mr. Whiston to publish an answer in 1726. In 175 Antoninus made a treaty with several nations of Germany. Soon after, Avidius Cassius, governor of Syria, revolted from the emperor: this insurrection, however, was put an end to by the death of Cassius, who was killed by a centurion named Anthony. Antoninus behaved with great lenity towards those who had been engaged in Cassius's party: he would not put to death, nor imprison, nor even sit in judgment himself upon any of the senators engaged in this revolt; but he referred them to the senate, fixing a day for their appearance, as if it had been only a civil affair. He wrote also to the senate to act with indulgence rather than severity; not to shed the blood of any senator or person of quality, or of any other person whatsoever, but to allow this honor to his reign, that, even under the misfortune of a rebellion, none had lost their lives, except in the first heat of the tumult. In 176 Antoninus visited Syria and Egypt: the kings of those countries, and am-

bassadors from Parthia, came to visit him. He staid several days at Smyrna; and, after he had settled the affairs of the east, went to Athens, on which city he conferred several honors, and appointed public professors there. From thence he returned to Rome with his son Commodus, who was chosen consul for the year following, though he was then but sixteen years of age. On the twenty-seventh of September, the same year, he gave him the title of Imperator; and on the twenty-third of December he entered Rome in triumph, along with Commodus, on account of the victories gained over the Germans. Dion Cassius tells us, that he remitted all the debts which were due to himself and the public treasury, during forty-six years, from the time that Adrian had granted the same favor, and burnt all the writings relating to those debts. He applied himself likewise to correct many enormities, and introduced several excellent regulations. In 179 he left Rome with his son Commodus, to go against the Marcomanni, and other barbarous nations; and the year following gained a considerable victory over them, and would, in all probability, have entirely subdued them, had he not been seized with an illness, which carried him off on the 17th of March 180, in the fifty-ninth year of his age, and nineteenth of his reign. The whole empire regretted the loss of so valuable a prince, and paid the greatest regard to his memory: he was ranked amongst the gods, and almost every person had a statue of him in their houses. His book of Meditations has been much admired.

Antoninus's Column, a circular pillar of white marble, raised in honor of the emperor Antoninus, at Rome, 168 feet high above ground, besides seven feet under ground. It has a staircase within, consisting of 198 steps, and illuminated with fifty-six small windows. Its shaft is adorned with a basso relievo, running in a spiral line its whole length, and containing a brief history of the emperor's reign.

Antoninus's Wall, the third rampart that had been built by the Romans against the incursions of the North Britons. It is called by the people in the neighbourhood Graham's Dyke; from the notion that one Graham, or Grimus, first made a breach in it after the retreat of the Romans out of Britain. The first barrier erected by the Romans was the chain of forts built by Agricola, from the frith of Forth to that of Clyde, in the year 81, to protect his conquests from the inroads of the Caledonians. See Agricola. The second was the vallum or dyke thrown up by Adrian in the year 121. See Adrian's Wall. It terminated on the western side of the kingdom at Axelodunum, or Burgh, on the Solway Sands; and was supposed to have reached no further than Pons Ælii, or Newcastle, on the eastern side. But, from an inscription lately discovered, it appears to have extended as far as the wall of Severus. See Severus's Wall. This rampart of Adrian's was situated much farther south than Agricola's chain; the country to the north having been either, according to some authors, recovered by the native Britons after the departure of Agricola; or, according to others, voluntarily slighted by Adrian. However, this work of Adrian's did not long continue to be t extreme boundary of the Roman territories to the north in Britain. For Antoninus Pius having, by his lieutenant Lolfius Urbicus, recovered the country once conquered by Agricola, commanded another rampart to be erected between the friths of Forth and Clyde, in the tract where Agricola had formerly built his chain of forts. The great number of inscriptions which have been found in or near the ruins of this wall, to the honor of Antoninus Pius, leave us no room to doubt its having been built by his orders. I the fragment of a Roman pillar with an inscription, now in the college library of Edinburgh, belonged to this work, as it is generally supposed to have done, it fixes the date of its execution to the third consulship of Antoninus, which was A. D. 140, only twenty years after that of Adrian, of which this seems to have been an imitation. This wall, as some imagine, reached from Caerridden on the frith of Forth, to Old Kirkpatrick on the Clyde; or, as others think, from Kinniel on the east, to Dunglass on the west. These different suppositions hardly make a mile of difference in the length of this work, which, from several actual mensurations, appears to have been thirty-seven English, or forty Roman miles. Capitolinus, in his life of Antoninus Pius, affirms, that the wall which that emperor built in Britain was of turf. This is unquestionably true; though it is evident from the vestiges of it still remaining, (which not very many years ago were dug up and examined for near a mile together), that the foundation was of stone. Mr. Camden also tells us, from the papers of one Anthony Pont, that the principal rampart was faced with square stone, to prevent the earth from falling into the ditch. The chief parts of this work were: 1. A broad and deep ditch, whose dimensions cannot now be discovered with certainty, though Mr. Pont says it was twelve feet wide. 2. The principal wall, about twelve feet thick at the foundation, but its original height cannot now be determined. This wall was situated on the south brink of the ditch. 3. A military way on the south side of the principal wall, well paved, and raised a little above the level of the ground. This work, as well as that of Adrian, was defended by garrisons placed in forts and stations along the line of it. The number of these forts whose vestiges were visible in Mr. Pont's time, were eighteen, situated about two miles from each other. In the intervals between the forts, there were watch towers; but their number and distances from each other cannot now be discovered. It is not a little surprising that, though it is now more than 1660 years since this work was finished, and more than 1300 since it was slighted, we can yet discover, from authentic monuments which are still remaining, by what particular body of Roman troops almost every part of it was executed. This discovery is made from inscriptions upon stones, which were originally built into the face of the wall, and have been found in or near the ruins, and are carefully preserved. The number of stones with inscriptions of this kind now extant is eleven; of which six may be seen at one view in the college of Glasgow, one in the ca

lege of Aberdeen, one in the college of Edinburgh, one in the collection of Baron Clerk, one at Cochnoch house, and one at Calder house. From these inscriptions it appears in general, that this great work was executed by the second legion, the vexillations of the sixth legion, and of the twentieth legion, and one cohort of auxiliaries. If these corps were all complete, they would make in all a body of 7800 men. Some of these inscriptions have suffered greatly by the injuries of time and other accidents; so that we cannot discover from them with absolute certainty, how many paces of this work were executed by each of these bodies of troops. The sum of the certain and probable information contained in these inscriptions, as it is collected by the learned Mr. Horsley, stands thus:

	Paces.
The second legion built	11,603
The vexillation of the sixth legion . .	7,411
The vexillation of the twentieth legion	7,801
All certain . . .	26,815
The vexillation of the twentieth legion, the monument certain, and the number probable	3,411
The same vexillation, on a plain monument, no number visible, supposed .	3,500
The sixth legion, a monument, but no number, supposed	3,000
Cohors prima Cugernorum	3,000
Total . .	39,726

or 39 miles 726 paces, nearly the whole length of the wall. It would have been both useful and agreeable to have known how long time these troops were employed in the execution of this great work; but of this we have no information: neither do we know what particular bodies of troops were in garrison in the several forts and stations along the line of this wall, because these garrisons were withdrawn before the Notitia Imperii was written. Though we cannot discover exactly how many years this wall continued to be the boundary of the Roman territories in Britain, yet we are certain it was not very long; for we are told by Dion Cassius, that 'Commodus, the son of Antoninus, had wars with several foreign nations, but none so dangerous as that of Britain: for the people of the island, having passed the wall which divided them from the Romans, attacked them, and cut them in pieces.' This was about A.D. 180.

ANTONIO (Nicholas), knight of the order of St. James, and canon of Seville, was born at Seville in 1617, being the son of a gentleman whom Philip IV. made president of the Admiralty in that city in 1626. After having gone through a course of philosophy and divinity in his own country, he went to study law at Salamanca; where he attended the lectures of Francisco Ramos del Manzano, afterwards counsellor to the king, and preceptor to Charles II. Upon his return to Seville, he employed himself several years in writing his Bibliotheca Hispanica, having the use of the books of Bennet de la Serra, abbot of the royal monastery of Benedictines. In 1659 he was sent to Rome by Philip IV. in the character of agent-general: he had also particular commissions from the inquisition of Spain, the viceroys of Naples and Sicily, and the governor of Milan, to negociate their affairs at Rome. The cardinal of Arragon procured him, from Pope Alexander VII. a canonry in the church of Seville, the income whereof he employed in charity and purchasing books; of which he had above 30,000 volumes in his library. By these means, and his own indefatigable application, he was at last enabled to finish his Bibliotheca Hispanica in four volumes folio, two of which he published at Rome in the year 1672. The work consists of two parts; the one containing the Spanish writers who flourished before the fifteenth century, and the other those since the end of that century. After the publication of these two volumes, he was recalled to Madrid by Charles II. to take upon him the office of counsellor to the crusade; which he discharged with great integrity till his death, in 1684. He left nothing but his vast library, which he had brought from Rome to Madrid; and his two brothers and nephews being unable to publish the remaining volumes of his Bibliotheca, sent them to cardinal d'Aguirre, who paid the charge of the impression, and committed the care of it to Monsieur Marti, his librarian, who added notes in the name of the cardinal.

ANTONIO (di Messina), a native of Messina, who flourished about the year 1430. He was the first Italian who painted in oil, which art he learned from John Van Dyck in Flanders. When he returned to Italy he imparted his secret to Bellini and Dominico, the last of whom revealed it to Andrew del Castagno, who, from a thirst of gain, basely assassinated him. These incidents, however, spread the art of oil-painting over Italy.

ANTONIO, ST. a Dutch fort in Axim, on the gold coast of Africa. It stands on a high rock, which projects into the sea in form of a peninsula, and is so environed by rocks and dangerous shoals, as to be inaccessible to an enemy but by land, where it is fortified by a parapet, draw bridge, and two batteries of heavy cannon. Besides this it has a battery towards the sea. The three batteries consist of twenty-four cannon. Its form is triangular; the building is neat, strong, and commodious for its extent, which is but small, on account of the narrowness of the rock on which it is built. The garrison is usually composed of twenty-five white men, and an equal number of negroes, under the command of a sergeant. It is maintained at the expense of the West India Company, and when well stored with provisions is capable of making a long defence against any number of negroes. It is, however, as well as all other forts on this coast, liable to inconveniences from the heavy rains, which damage the walls, and render frequent reparations necessary. This obliges the Dutch always to keep ready a quantity of lime made of calcined oyster-shells, of which the coast produces great numbers. This settlement was first founded by the Portuguese during the reign of Emmanuel. They fixed at first upon a small point; where, finding themselves insecure, they built the fort where it now stands. They were

driven out by the Dutch in 1642; and upon the conclusion of a peace with the states-general the fort remained by treaty in the hands of the Dutch West India Company, who have kept possession of it ever since.

Antonio, St. one of the Cape de Verd Islands, separated from St. Vincent's by a narrow navigable channel, fifteen miles broad. On the north side it has a good road for shipping, with a collection of fresh water rising from springs, which, however, scarcely merits the name of a pond. The island stretches from north-east to south-west, and is filled with mountains; one of which is of so extraordinary a height, as to be compared with the Peak of Teneriffe. Its top is constantly covered with snow; and notwithstanding the clearness of the sky is generally hid in clouds. Here are produced a variety of fruits; oranges, lemons, palms, melons, &c. and some sugar-canes. The potatoes and melons are particularly excellent, and are much sought after by mariners. But notwithstanding all this plenty, the inhabitants live in the most wretched poverty. They are in number about 500, chiefly negroes, under the Portuguese, whose language they speak, and whose manners they imitate. To the north-west stands a village, under the direction of a governor, or, as they call him, a captain, a priest, and a schoolmaster. Long. 0° 26′ E., lat. 18° 4′ N.

Antonio, St. a city of Mexico, capital of the province of Texas; situated near the source of a river of that name, and containing about 2000 inhabitants. The houses are wretched, but about four miles distant are three missions, which are in a flourishing state.

Antonio, St. della Florida, a town in Chili, in the province of Maule. Long. 71° 41′ W., lat. 30° 20′ S.

Antonio, St. de los Cues, a populous town of Mexico, on the road from Orizaba to Oaxaca, celebrated for the remains of some ancient Mexican fortifications.

Antonio, St. a small island on the coast of Brasil, near the island of Santa Catalina, where the Portuguese have a fort.

ANTONIUS (Caius), the son of Marcus the orator, and uncle to the triumvir; had the command of some troops of horse under Sylla, and plundered many places in Greece.

Antonius Gnypho, a native of Gaul, who came to Rome and taught rhetoric and poetry in the house of Julius Cæsar while he was but a boy. His school was frequented by Cicero and other great men. He set no price upon his labors, which made his scholars the more liberal to him.

Antonius (Julius), the son of Marcus, was consul along with Paulus Fabius Maximus, to whom Horace addresses the second Ode of his fourth book.

Antonius (Marcus), a famous Roman orator. While he filled the office of prætor, Sicily fell to his lot, and he cleared the seas of the pirates which infested that coast. He was made consul with A. Posthumius Albinus in the year of Rome 653; when he opposed the turbulent designs of Sextus Titus, tribune of the people, with great resolution and success. Some time after he was made proconsul of Cilicia, and obtained the honor of a triumph on his return. To improve his talent for eloquence, he attended the greatest orators of Rhodes and Athens, in his way to Cilicia, and on his return to Rome. Soon after he was appointed censor: which office he discharged with great reputation. He was one of the greatest orators ever known at Rome; and it was owing to him, according to the testimony of Cicero, that Rome might boast herself a rival even to Greece in eloquence. He defended, amongst many others, Marcus Aquilius; and moved the judges in so sensible a manner, by the tears he shed, and the scars he showed upon the breast of his client, that he carried his cause. He never would publish any of his pleadings, that he might not be proved to say in one cause, what might be contrary to what he should advance in another. He affected to be a man of no learning. His modesty, and many other qualifications, rendered him no less dear to many persons of distinction, than his eloquence made him universally admired. He was killed during those bloody confusions raised at Rome by Marius and Cinna. He was discovered in the place where he hid himself, and soldiers were sent to despatch him; but his manner of addressing them had such an effect, that none but he who commanded them, and had not heard his discourse, had the cruelty to kill him. His head was exposed before the rostra, a place which he had adorned with his triumphal spoils. This happened A. A. C. 90.

Antonius (Marcus), the triumvir, grandson to the former. When the civil war broke out, Antony was persuaded by Curio to take Cæsar's part, for which he was made a tribune of the people, and in that office did Cæsar great service. Cæsar having made himself master of Rome, gave Antonius the government of Italy; and at the battle of Pharsalia confided so much in him, that he gave him the command of the left wing of his army, whilst he himself led the right. After Cæsar was made dictator, he made Antonius general of the horse, in which station he exerted his power with the utmost violence. He was made consul, when Cæsar enjoyed that honor for the fifth and last time. On Cæsar's death he harangued the populace with great art, and raised their fury against his murderers, flattering himself that he should easily get into the place which Cæsar had filled; but his haughty behaviour made him lose all the advantages his affected concern for Cæsar had gained him. His ill-treatment of Octavius, and quarrel with him, produced another civil war, which ended in an accommodation between him, Octavius, and Lepidus, fatal to the peace of Rome. They agreed to share the supreme power among them; and many of the most illustrious Romans were sacrificed by proscription to cement this bloody league, which is known by the name of the 'second triumvirate.' But the triumvirs were too ambitious, and hated one another too much to be long united. Antonius went into Asia to raise money for his soldiers; during his absence, Fulvia his wife quarrelled with Octavius. When Antonius was in Asia, indulging himself in all manner of luxury, the famous

Cleopatra inspired him with the most violent passion. Hearing of the quarrel between Fulvia and Octavius, and finding Octavius was become publicly his enemy, Antonius entered into a confederacy with Sextus Pompeius, who was still master of Sicily. He then went into Italy to meet Octavius in battle, but Fulvia, who had been the promoter of this war, dying, Octavius and Antonius came to an agreement. One of the conditions of this new peace was, that they should together attack Pompey, though the former had lately made an alliance with him. Antonius then married Octavia, sister to Octavius, as pledge of their renewed friendship; but returned soon after to his beloved Cleopatra, and lived with her in Alexandria. Octavius took hold of this pretence to inveigh against him, and begin the war again. At last they engaged in a sea-fight at Actium, in which Octavius gained a complete victory. The infatuated Antonius fell upon his own sword; and Cleopatra stung herself to death with an asp, to avoid gracing the victor's triumph at Rome.

ANTONOMA'SIA; *αντι* and *ονομα*. A mode of speaking in which a person is addressed or described by some appropriate or official designation, but not by his surname; as, in the House of Lords, 'the Noble Lord;' in the House of Commons, 'the Honorable Gentleman.'

This way of speaking, which the grammarians call *antonomasia*, and which is still extremely common, though now not atall necessary, demonstrates how much mankind are naturally disposed to give one object the name of any other which nearly resembles it, and thus to denominate a multitude, by what was originally intended to express an individual.

A. Smith on the Formation of Languages.

ANTONI, a small town of France, in the department of the Seine, arrondissement of Sceaux, it is two leagues S. S. W. of Paris, chiefly noted for candle manufactories, and containing 1,200 inhabitants.

ANTOPHYLLUS, in botany, the fruit of the clove-tree.

ANTOSIANDRIANS, a sect of rigid Lutherans, who oppose the doctrine of Osiander relating to justification. They deny that man is made essentially, but only imputatively, just; or, that he is not really made just, but only pronounced so.

ANTRAIN, a town of France, in the department of Ille and Vilaine, seated on the Couesnon, on the borders of the ci-devant province of Normandy, fifteen miles south of Avranches.

ANTRE. Lat. *antrum*. A cave or den; used both in Latin and English only in poetry.

> With all my travels history,
> Wherein of *antres* vast, and desarts idle,
> It was my bent to speak. *Shakspeare.*

ANTRIM, a country in the province of Ulster in Ireland, comprising the northern extremity of that island. Its greatest length is about fifty-four miles, and breadth thirty-five; being bounded on the north and east by the sea, on the south by Lough Neagh and the county of Down, and on the west by that of Londonderry. The general features of this county are mountainous, diversified by numerous bogs, rivers, and lakes, and, on the whole, more deserving of notice for their picturesque appearance than for cultivated scenery.

From Fair Head to Glenarm, in particular, with the exception of a portion of bog, in the vicinity of that gigantic promontory, the scenery is exceedingly beautiful. Along the sea-side, from Creshendall to Glenarm, passing by Red Bay, the road presents the most romantic and lovely prospects. 'On the one hand,' says Mr. Wakefield, 'magnificent and widely extended views of the ocean, which on this coast rolls its swelling waves towards the shore with a peculiar and dangerous rapidity; and on the other, rocky mountains of considerable height, whose hanging cliffs, as the road extends partly up their sides, seem to threaten the traveller with destruction, and which, in some places, are thickly clothed with woods, through the openings between which, the eye is sometimes surprised by the sight of a village. As the road winds round a great many spacious bays, which abound on this part of the coast, few rides can be more agreeable.' Between Larne and Carrickfergus, the country displays every sign of active and well-remunerated industry, and, of course, an abundant and happy population. The interior of the county, towards the eastern side, is very mountainous, and is scantily planted. But on the borders of Antrim and Down, between Lisburn and Belfast, the scenery is grand and striking, the land well cultivated, and adorned by elegant villas and flourishing plantations. The whole northern shore of Belfast lough is also dotted with the white country residences of the merchants and manufacturers of Belfast. Between that populous and enterprising town and Armagh, the common price of land is thirty years' purchase. The landed property is nearly all held of the crown. The Marquis of Hertford's estate contains, it is said, 64,000 acres of arable ground, besides bog and mountain. The other great proprietors are the Antrim family, the marquis of Donegal, Lord Templeton, and Lord O'Neil. Antrim has long been celebrated for its linen manufacture. A few years ago not less than 11,000 acres of flax were grown, yielding at the average rate of thirty stones per acre. The manufacture of cotton cloth has, however, of late years in some degree superseded the staple of Antrim, and given employment to nearly 30,000 persons; and as German linens are found to obtain a decided preference to the foreign market to those which are made in any part of Great Britain, it is probable that the culture of flax will gradually give way to the importation of cotton.

The population of this county is estimated at 250,000, exhibiting an increase of near 100,000 in the space of thirty years. It contains a greater proportion of Protestants than any other county of Ireland; and as the inhabitants are chiefly of Scottish extraction, the majority of them are presbyterians.

The exports of Antrim consist, in addition to its linen, principally of provisions. In the year 1811, not fewer than 70,000 pigs, weighing at least 200lbs. each, were carried to Belfast. A branch of trade, it should be added, which has been much diminished by the continuance of peace.

The only remarkable mineral of this district is the fossil wood, or wood coal, as it is more commonly called, and which is found under masses of basaltic rock. Mr. Playfair, of Edinburgh, in arguing for the vegetable composition of coal, refers it to some specimens procured in the Isle of Sky, the same geological structure with Antrim, which presented in one small fragment both perfect wood coal and perfect mineral coal; thus, in his mind, establishing the identity of the two species, and also their common vegetable origin. In this portion of Ireland the fossil wood presents itself with its original structure so entire that there is no difficulty in ascertaining its place as a member of the forest tribes. The bark and knots are quite distinct; and the rings, denoting the annual growth of the tree, may still be counted. It is a circumstance, however, worthy of remark, that notwithstanding the ligneous origin of the Antrim coal, it is so fully impregnated with bitumen as to be thought unfit for the purposes of the arts, and even for the humbler uses of domestic life.

This county returns five members to parliament; namely, two for the shire, and three for the three principal towns, Belfast, Carrickfergus, and Lisburn: in regard to ecclesiastical rule, the whole of it, with the exception perhaps of three or four parishes, is under the superintendance of the Bishop of Connor.

Antrim, on its northern boundary, contains the celebrated GIANT'S CAUSEWAY, for which see that article.

ANTRIM, a town of Ireland, and capital of the foregoing county, is situated at the north end of Lough Neagh, upon the banks of a small stream called the Six Mile Water. It has a good pier, near which vessels can lie at low water; but the custom-house, which was formerly established here, has been removed to Belfast. This was once an important borough; the mayor of Antrim being admiral *ex-officio* of a great extent of coast, both in Antrim and in Down. It is still a place of consideration, and is daily becoming of more consequence. Before the Union it sent two members to Parliament. In the streets a sharp engagement took place in 1798, between a detachment of regular troops, and about 6000 insurgents, who were defeated. It gives the title of earl to the noble family of M'Donnel. It is eighty-four miles from Dublin, and twelve from Belfast

ANTROS, a small island at the mouth of the Garonne, on the west coast of France, containing the light-house of Corduan.

ANTRUM, one of the Alps of Switzerland in the Valais, across which is a road from Valais to Lombardy.

ANTRUM; Lat. a den or cave; in anatomy, a cavity; in which sense it gives name to several parts of the body: as, antrum buccinosum, the cochlea of the ear; antrum genæ, a large cavity in the fourth bone of the upper jaw, called by Dr. Highmore, antrum maxillæ superioris: antrum highmorianum is a cavity within the sinus of each axillary bone, sometimes mistaken for a caries of the bone. Antrum pylori, a large cavity at the bottom of the pylorus, thus denominated by Willis, who assigned it the office of keeping the first digested chyle, till that which was later taken into the stomach be digested; though if what Dr. Warton suggests, that there are lacteals at the bottom of the stomach, be true, such a provision seems unnecessary.

ANTWERP, Antwerpen, Germ. Dutch. Anvers, Fr. Amberes, Sp. a province of the Netherlands, situated between 4° 13′ and 5° 16′ E. lon., 51° and 51° 32′ N. lat. having North Brabant on the N. and N. E. Limburg on the S. E. South Brabant on the S. and East Flanders on the W. It contains 191½ square G. M. and is so low a level, that water is found every where at the depth of ten or twelve inches. The soil is sandy throughout, but is well cultivated and watered by the Scheldt, Dyle, Senne, Great and Little Nethe, and the Rupel, besides the two canals of Brussels and Louvain. The climate is so moist, that the quantity of rain which falls annually amounts from 28 to 28½ inches. The grain raised is about the quantity required for its own consumption. The average crops are: wheat 73,347 cwt.; rye 415,568 cwt.; barley 109,267 cwt.; and oats 237,921 cwt. They also grow, on a large scale, buckwheat, beans, potatoes, turnips, carrots, flax, hemp, rape-seed, and madder. Here are 136,014 acres of arable land, 27,000 acres of wood, 40,345 acres of natural, and 13,155 acres of artificial grass. Much attention is paid to cattle, and the horses are large and strong, but not handsome. They have many hives of bees, and remove them from place to place to improve the honey. Their manufactures are numerous, and some of them in great esteem; as, for instance, the point-lace of Mechlin. The exports consist of lace, hats, cloths, ticking, woollen wrappers, sugar, starch, leather, beer, brandy, &c. The population in 1815 amounted to 287,347; which gives 1500 for every square mile. The majority are Walloons, who profess the Roman Catholic religion, and have twenty-four parishes and 131 curacies. The province sends five deputies to the States General, belongs to the fourth military division, and is under the jurisdiction of the High Court of Justice at Brussels. The provincial states consist of sixty members, of whom fifteen are sent by the nobility, twenty-four by the towns, and twenty-one by the country. The province contains the three circles of Antwerp, Mechlin, and Turnhout, seventeen districts and 141 communities.

ANTWERP, ANVERS, or ANTORFF, the capital, situated on the Scheldt, was formerly the place of greatest trade in Europe. In 1550, the epoch of its prosperity, it was not unusual to see 2000 vessels at one time in the port. But the war of the low countries, and the persecutions of the Duke of Alva, forced the most industrious part of the population to emigrate; and an article in the treaty of Munster, in 1648, stipulated that no large merchant vessels should sail up to this city but that the cargo should be first unloaded in the Dutch ports, and thence conveyed in small craft to Antwerp. According to Guicciardini, the population of Antwerp was formerly 100,000; but Busching, a better authority, raises the number to 200,000. It contains at present 61,800. It is still, however, a large and well-built city, having 200 streets, and twenty-two spacious and elegant squares. The Mere is one of the wide

streets in Europe; the cathedral is a very noble pile, and contains the celebrated Descent from the Cross, of Rubens. The exchange cost 300,000 crowns, and is reckoned the handsomest building of its kind in existence.

Antwerp, until its late occupation by the French, was an open town, defended only by a citadel erected by the Duke of Alva in 1568. Under their dominion, however, it underwent great and extensive improvements; its harbour was enlarged, dock-yards for building vessels of war were constructed, and it became one of the first naval ports in Europe. The harbour will contain upwards of 1000 vessels, which, by means of canals, can penetrate to almost any part of the town. It is twenty-two miles north of Brussels. E. lon. 4° 24′, N. lat. 51° 13′.

ANTYLION, in pharmacy, a very astringent amalgam, described by Ægineta.

ANVARI, a Persian poet of the twelfth century, who acquired such renown that the surname of king of Khorasan was bestowed upon him. He was at first much attached to astrology, but, having once made a false prediction, he retired from court and wrote a poem in which he altogether renounced astrology and prediction. He died at Balk about 1200.

ANUBIS, a symbolical deity of the Egyptians, generally represented in the form of a man with a dog's head, bearing a branch of palm in one hand, and a caduceus in the other. Cynopolis, the present Mineh, situated in the lower Thebais, was built in honor of Anubis, but the temple wherein he was worshipped no longer exists. The priests celebrated his festivals with great pomp, and consecrated the dog to him as the living representation. Anubis, says Strabo, is the city of dogs, the capital of the Cynopolitan prefecture. These animals are fed there on sacred aliments, and religion has decreed to them a worship; but Cambyses having slain the god Apis, and thrown his body into a field, all animals respected it except the dogs, which alone ate of his flesh. This impiety diminished the popular veneration. Rome having adopted the ceremonies of Egypt, the emperor Commodus, to celebrate the Isiac feasts, shaved his head, and himself carried the statue of the god Anubis, which was of massive gold. A figure of this god is given on the reverse of a medal of Faustina, with the sistrum in one hand, and the caduceus in the other. The signification of this emblematical deity is thus explained by Plutarch: 'the circle which touches and separates the two hemispheres, and which is the cause of this division, receiving the name of horizon, is called Anubis. He is represented under the form of a dog, because that animal watches day and night.' Others pretend that these animals, the faithful guardians of men, indicate the trophies which guard the sun on the south and north like porters. According to the former of these interpretations, the priests, regarding Anubis as the horizon, gilded his statue; to mark that this circle, receiving the first rays of the sun, appears sparkling with brightness on his rising, and that at his setting he reflects his last rays upon the earth. According to their sacred fables Anubis was the son of Osiris, but illegitimate: he only gives to the earth a borrowed light; and cannot be esteemed, like Horus, the father of the day, or the legitimate offspring of Osiris. It would seem that Anubis at first was only a symbolical image, invented by astronomers to give a sensible expression of their discoveries: that afterwards, the people accustomed to see it in their temples, which were the depositories of science, adored it as a deity; and that the priests favored their ignorance by connecting it with their religion. The worship of Anubis introduced that of the dog as his emblem.

ANVEILER. See ANWEILER.

ANUI, GREAT and DRY, two large rivers of Siberia, falling into the Kolyma, or Kovyma, nearly opposite to the fortress Nischney Kolymsk. The course of the former is 600 miles, and that of the latter 330. The banks of both are inhabited by a tribe called Yukagirians.

AN'VIL, ANVILLE. Æneille, Anpile, from æn, on, and feallan, to fall, so called (according to Skinner) from the frequent strokes of the hammer falling on the block. The mass of wrought iron used by smiths to forge or hammer their metal on.

Although I could not make so well
Songs ne knew the art all,
As coud Lamekes son Tuball,
That found out first the art of song;
For as his brother's hammers rong
Upon his *anuelt* vp and down,
Therof he toke the first sowne.
The Dreame of Chaucer, fol. 244. c. 1.

Here I clip
The *anvil* of my sword, and do contest
Hotly and nobly. *Shakspeare.*

I saw a smith stand with his hammer, thus,
The whilst his iron did on his *anvil* cool. *Id.*

It must be told;
Yet ere you hear it, with all care put on
The surest armour *anvil'd* in the shop
Of passive fortitude; the good Cleander,
Your friend is murther'd.
Beau. and Fletch. Lover's Progress, act iv.

On their eternal *anvils* here he found
The brethren beating, and the blows go round.
Dryden.

Several members of our house, knowing what was upon the *anvil*, went to the clergy, and desired their judgment. *Swift.*

Now Cyclopean chief!
Quick on the *anvil* lay the burning bar,
And, with thy lusty fellows, on its sides
Impress the weighty stroke.
Jago's Edge Hill, book iii.

ANVIL. The face or upper surface must be very flat and smooth, without flaws, and so hard that a file will not touch it. At one end there is generally a beak-iron for the rounding of hollow work. The whole is usually mounted on a firm wooden block. Forged anvils are better than those of cast work, and the best have the upper part made of steel. Locksmiths have a smaller kind of anvil called the stake, which is moveable, and placed ordinarily on their wood bench. Its use is for setting small cold work straight, or to cut or punch on with the cold chisel or cold punch.

ANVILLE (Jean Baptiste Bourguignone d'), geographer to the king of France, was born at Paris in 1697. He was a most industrious student, and it is said he labored fifteen hours every day for fifty years, in the improvement of geography. He died in January, 1782. His maps and charts, especially those connected with ancient geography, are in the highest esteem for their accuracy, and the learning and research evinced in their composition. Of his other works, the principal are, Particulars of Ancient Gaul, from the Remains of the Romans; Ancient and Modern Egypt, with a description of the Arabian Gulf; a Treatise on the Extent and Topography of ancient Jerusalem; an Abridgment, in 3 vols., of Ancient Geography, and a Companion to his maps; a Dissertation on ancient and modern Itinerary Measures; on the European Governments which rose out of the fall of the Roman Empire; a Proposition for the Mensuration of the Globe; a Geographical Analysis of Italy; Considerations on the Ottoman Empire; Memoirs of the Empire of China; Treatise on the Caspian Sea.

ANVILLE ISLAND, an island in the gulf of Georgia, on the west coast of North America, first discovered by captain Vancouver, and so called from its shape. Long. 237° 3′ E., lat. 49° 30′.

ANUROGRAMMUM, in ancient geography, the capital and royal residence of Taprobane, Ceylon, on the north side not far from the western coast, now called Anarodgurro, but in ruins. *Ptol.* vii. 2.

ANUS, in anatomy, the lower extremity of the intestinum rectum, or orifice of the fundament. See ANATOMY, Index. Also a small hole in the third ventricle of the brain.

ANUS, diseases of the, are a fistula, the procedentia or prolapsus ani; to which may be added the hæmorrhoids, or piles. Imperforated anus: when children are born without an anus, it is very difficult to find the right part for making a perforation in the rectum, because the extremity of the gut is generally formed into a knot. For performing such an operation, M. Petit recommends a trocar, the canula and circular plate of which are so slit open as to serve as a groove for a bistoury to be run in, to enlarge the aperture after the trocar has been pushed into the gut. The muscles of the anus are the sphincter, levator, and scalptor, or latissimus dorsi.

ANUS, in botany, the posterior opening of a monopetalous flower.

ANUS, in entomology, a species of murex, in the class vermes.

ANWEILER, a town of the duchy of Deux Ponts, on the Queich; six miles from Landau. It was originally a free city of the empire, but brought under the dominion of the counts Palatine in 1330. The inhabitants, about 1800 in number, are partly Catholic and partly of the reformed religion. The Queich is a medium of communication between this place and Landau. The only manufacturing establishments are tanneries. Lon. 8° E., lat. 49° 13′ N.

ANXA, in ancient geography, the Roman name of the ancient Gallipolis, and modern Gallipoli, Naples.

ANXI'ETY, ANX'IOUS, AN'XIOUSLY, AN'XIOUSNESS. *Anxietas*, Lat. from *angere*, which appears to derive its origin from *αγχω*, to strait-en. Anxiety, anger, and anguish, are cognate words. Anxiety is an intermitting pain arising from doubt and uncertainty as to an event, or series of events, calculated to afflict us and interrupt our peace of mind.

And albeit that God cōmaunded yᵗ we should chiefly seke for heuen, and promiseth that if we do so, all other thīges that we nede shal be cast vnto vs, and would that we should in no wise liue in *anxyete*, and trouble of mind, for any fere of lack.

Sir Thomas More's Works, fol. 197. c. ii.

His pensive cheek upon his hand reclin'd,
And *anxious* thoughts revolving in his mind.

Dryden.

With beating hearts the dire event they wait,
Anxious, and trembling for the birth of fate. *Pope.*

To be happy, is not only to be freed from the pains and diseases of the body, but from *anxiety* and vexation of spirit; not only to enjoy the pleasures of sense, but peace of conscience and tranquillity of mind.

Tillotson.

In *anxieties* which attend fevers, when the cold fit is over, a warmer regimen may be allowed; and, because *anxieties* often happen by spasms from wind, spices are useful. *Arbuthnot.*

The story of a man who grew gray in the space of one night's *anxiety*, is very famous. *Spectator.*

How much better is it to take our lot where it shall please Providence to cast it, without *anxiety*!

Cowper's Letters.

How little we know of a state to which we are all destined; and how does the obscurity, that hangs over that undiscovered country, increase the *anxiety* we sometimes feel as we are journeying towards it!

Id.

ANXUR, in ancient geography, a city of the Volsci in Latium; called Tarracina, by the Greeks and Latins: now Terracina, situated on an eminence.

ANXURUS, AXURUS, or AXYRUS, epithets of Jupiter worshipped at Anxur, as a beardless boy.

A'NY, ANY'WHERE. Eine, one. Applied to every individual of a given number, without distinction.

He beod for to ȝeue hym ys doȝter in spousyng
þe noblest damesel þat was in *eny* londe.

R. Gloucester, p. 65.

Neyther besemeth it suche as are in Christes stede to be *anywhere* oftener than in the temple.

Udall. Marke, c. xi.

Far from me and my friends be such frigid philosophy as may conduct us indifferent and unmoved over *any* ground which has been dignified by wisdom, bravery, or virtue. *Johnson.*

I do not like to see *any* thing destroyed; *any* void produced in society; *any* ruin on the face of the land.

Burke.

ANYTUS, an Athenian rhetorician, who, in conjunction with Melitus, distinguished himself by the rancor with which he persecuted Socrates. His machinations at length succeeded in procuring the death of his enemy; but popular opinion soon changing, the persecutor in his turn was condemned to exile at Heraclea, and, according to some accounts, stoned to death in that city. The ridicule thrown upon Socrates by Aristophanes, in The Clouds, is said to have originated in his instigation.

ANZAR, a town of Northern China, in which Tamerlane died.

ANZI, a small town and marquisate in the province of Basilicata, Naples, belonging to the prince of Belvedere, of the family of Caraffa, eight miles S. E. of Potenza.

ANZICO, or Micocco, an extensive region of the west coast of Africa, in the interior, immediately behind Congo. It is very little known, nor have we any more recent accounts of it than those given in the sixteenth century, by the Portuguese travellers Lopez and Merolla. The people are said to be brave, active, and of the most extraordinary agility, but savage and cruel in a degree almost unparalleled. Human flesh is said to be commonly exposed in their markets; they devour not only the prisoners taken in war, but their own slaves; and it is considered as an homage due to their sovereign, that his subjects should offer themselves to him to be used as food. To balance these reports, which wear somewhat of a fabulous aspect, we learn that they are industrious, and manufacture cloths, both from silk and from the palm tree. They carry on an extensive trade both with Congo and with the interior, and seem to have the most commercial spirit of any nation in this part. Their language entirely differs from that of Congo.

ANZO, Anzeo, or Antis, Cape, a promontory of Italy, in the Campagna di Roma, on which there is a strong tower. Pope Benedict XIV. formed a commodious harbour here, an undertaking which had been ineffectually attempted by Innocent XII. The ruins of the town of Antium, from which it takes its name, cover a considerable space.

AONÆ, or Aonians, a people of Bœotia, in ancient geography; the name of Aonia was sometimes given to Bœotia.

AONIAN Mount, the hill Parnassus, fabled to have been the residence of the Muses.

AONIDES, in mythology, one of the many appellations of the Muses; so called from Aonia.

AONIS, in entomology, a species of papilio, a native of India.

AOR, a small island lying off the east coast of Malacca. Lat. 2° 25′ N., long. 104° 35′ E. Ships bound from China to the straits of Malacca generally anchor here if they can make the island in the morning. It stands very high above the sea, and is covered with a thick and lofty wood. Here is a small village of Malays, who supply vessels with cocoa nuts and vegetables.

AORASIA; from *a*, negative, and *οραω*, to see; in antiquity, the invisibility of the gods. The opinion of the ancients with regard to the appearance of the gods to men, was, that they never showed themselves face to face, but were known from their very manner as they withdrew. Neptune assumed the form of Calchas to the two Ajaxes; but they knew him not till he turned his back to leave them, and discovered the god by his majestic step as he went from them. Venus appeared to Æneas in the character of a huntress, but her son knew her not till she departed from him, her divinity was then betrayed by her radiant head, her flowing robe, and her majestic pace.

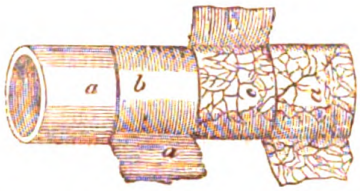
AORIST; *αοριστος*, indefinite; a term in the Greek grammar. A tense peculiar to the Greek language, comprehending all the tenses; or rather expressing an action in an indeterminate manner, without any regard to past, present, or future.

AORISTIA, in the sceptic philosophy, denotes that state of the mind wherein we neither assert nor deny any thing positively, but only speak of things as seeming or appearing to us in such a manner. The aoristia is one of the great points or terms of scepticism, to which the philosophers of that denomination had continual recourse by way of explication or subterfuge. Their adversaries, the Dogmatists, charged them, however, with asserting the principles and positions of their own sect to be true and certain.

AORNUS, a high rock of India, which derives its name from its extraordinary height, as being above the flight of a bird. Its circuit is above two miles, its height eleven furlongs, and the way leading up to the top artificial and narrow. This rock was taken by Alexander the Great, in whose time there was a report that Hercules had attempted it in vain. While the Macedonian monarch was preparing all things necessary for the siege, an old man with his two sons, who had long lived in a cave near the summit, came and offered to show him a private way of ascending. This being readily accepted, Ptolemy with a considerable body of light-armed troops, was despatched with them, with orders, in case they succeeded, to entrench themselves strongly upon the rock in the wood to which the old man was to direct them, before they ventured to attack the Indians. Ptolemy exactly executed his orders; and gave notice, by a lighted torch set upon a pole, that he had got safely up. Upon this Alexander gave immediate orders for a body of troops to attempt the passage by which the rock was commonly ascended; but they were repulsed with great slaughter. The next day, when Alexander renewed the attack, though Ptolemy attacked the Indians in the rear, the Macedonians were again repulsed on both sides. At last the king, perceiving that the strength of the Indians lay in the straitness and declivity of the way by which they were attacked, caused a great quantity of trees to be felled, and with them filled the cavities between the plain on which the Indians were encamped and the highest of his own advanced posts. The Indians at first derided his undertaking; but at length sent deputies to propose terms of capitulation. Alexander, suspecting that their design was only to amuse him till they made their escape, withdrew his guards from the avenues. As soon as he knew the Indians were descended, he, with 700 of Ptolemy's light-armed foot, took possession of the deserted rock, and then made a signal for his forces to fall upon the flying Indians. They, setting up a loud shout, so terrified the fugitives, that numbers of them fell from the rocks and precipices, and were dashed to pieces, while the greatest part of the remainder were cut off in the roads.

AORTA, *αορτη*; the great artery which rises immediately out of the left ventricle of the heart. Aorta is divided into two grand trunks, distinguished by the epithets ascending and des-

cending. See ANATOMY. The annexed diagram represents a part of the trunk of the Aorta turned inside out; *a a*, the glandulous membrane; *b b*, the vascular membrane; *c*, the internal tunic.



AORTE, or ORTEVILLE, an ancient town of Gascony, now included in the department of the Landes, arrondissement of Dax. The number of houses about 200. Four leagues south of Dax.

AOSTA, a duchy in Piedmont, separated by the Alps from Savoy and the Valais, and bounded on the east and south by the Novaresse, and the provinces of Biella and Ivrea. The aspect of the country is mountainous, but there are several valleys of great extent, particularly the Val d' Aosta. These low grounds are very fruitful in wine, oil, and pasture. The mountains yield iron and copper, and forges for these metals are very numerous. The inhabitants amount to about 66,000. A prince of the royal family (frequently the king's brother) takes his title from this duchy.

AOSTA, the chief town, is seated on the Doria, at the foot of the Alps, where the great commercial roads from Savoy and the Valais to Piedmont, over the Great and Little St. Bernard, meet. The bishop is subordinate to the archbishop of Milan. The town is large, but ill built and thinly peopled: the only edifice of note is the episcopal palace. Population 5550. Twenty-five miles N. W. of Ivrea, 150 N. N. W. of Turin.

AOSTA, a town of Syria, the residence of a Maronite patriarch, and thirty-five miles south of Tripoli.

AOTUS, in botany; from *α*, without, and *ους*, *ωτος*, an ear; Class and order, decandria monogynia. Natural order, papilionaceæ of Linnæus; Leguminosæ of Jussieu. Its generic character: CAL. perianth inferior, one leaf, bell-shaped: COR. papilionaceous, five petals: STAM. filaments ten, separate, awl-shaped, ascending, nearly equal, smooth, deciduous; antheræ oval, of two cells: PIST. germen roundish, with the rudiments of two seeds; style thread-shaped, parallel to the stamina, but rather longer, twisted after impregnation, stigma simple, bluntish: PERIC. legume nearly orbicular, acute, of one cell and two concave firm valves: SEEDS two, elliptical, inserted into the middle of the upper margin of each valve, without any crest or appendage. Essential characters: CAL. simple, five-cleft, two-lipped: COR. papilionaceous; wings shorter than the standard: STAM. deciduous: STYLE thread-shaped: STIG. obtuse: LEG. of one cell, and two valves: SEEDS two, without a crest; is nearly allied to Pultenæa, and had previously been confounded therewith, but besides the want of appendages to the calyx, and of a strophiolum, or crest, to the seeds, the style is not awl-shaped, but almost capillary, variously twisted as soon as the flower falls, rather swelling upwards, and the stigma is obtuse. One species only has been described: A. villosa, hairy aotus.

AOUTA, the name of the paper mulberry tree of Otaheite, in the South Sea, from which a cloth is manufactured that is worn by the principal inhabitants. The bark of the trees is stripped off and soaked; the fibres of the inner coat are then carefully separated from the rest of the bark; they are placed one by the side of another, till they are about a foot broad; and two or three layers are laid one upon the other. It is afterwards beaten on a smooth piece of wood with instruments marked length-ways, with small grooves of different degrees of fineness; and by means of this becomes as thin as muslin. After bleaching it in the air to whiten it, it is fit for use. This cloth is cool and soft, but as liable to be rent as paper. The colors with which it is dyed are principally scarlet and yellow.

APACE'. On pace, in speed, in haste.

When sparkling stars, amid the heaven's face,
With twinkling light shone on the earth *apace*,
That while they brought about the nightes chare,
The dark had dim'd the day ere I was ware.
Mirror for Magistrates, 1537.

Or when the flying libbard she did chace,
She could then nimbly move, and after fly *apace*.
Spenser.

Ay, quoth my uncle Glo'ster,
Small herbs have grace, ill weeds do grow *apace*:
And since, methinks, I would not grow so fast,
Because sweet flow'rs are slow, and weeds make haste.
Shakspeare.

He promis'd in his east a glorious race;
Now, sunk from his meridian, sets *apace*. *Dryden.*

Is not he imprudent, who, seeing the tide making haste towards him *apace*, will sleep till the sea overwhelm him. *Tillotson.*

Night wears *apace*,
And day-light must not peep on dark designs.
Dryden's Duke of Guise.

The baron now his diamonds pours *apace*;
Th' embroider'd king, who shows but half his face,
And his refulgent queen.
Pope's Rape of the Lock.

Gallop *apace*, bright Phœbus, through the sky,
And dusky night, in rusty iron car,
Between you both shorten the time I pray,
That I may see that most desired day,
When we may meet these traitors in the field.
Marlowe's Edward II.

Borne on the swift, though silent, wings of time,
Old age comes on *apace* to ravage all the clime.
Beattie's Minstrel.

APACHES, a people of New Mexico in North America, who revolted against the Catholic king, massacred several of his officers, and committed the greatest devastation, and have ever since remained the allies, not the subjects, of the Spaniards.

APACTIS; *Απακτος*, abductus, from *απαγω*, in botany. Class, dodecandria. Generic character: CAL. none: COR. four-petalled: PET. roundish, concave, unequal, two broad: STAM. filaments from sixeen to twenty: PIST. germ superior: STYLE none. Essential character: COR. four-petalled: CAL. none. There is but one species, the A. Japonica.

APÆDEUTÆ, illiterate persons. This term was particularly used among the French in the time of Huet; when the men of wit at Paris were divided into two factions, one called, by way of reproach, apædeutæ, and the other eruditi. The apædeutæ are represented by Huet as persons who, finding themselves either incapable or unwilling to undergo a severe course of study, in order to become truly learned, conspired to decry learning, and turn the knowledge of antiquity into ridicule, thus making a merit of their own incapacity. The apædeutæ were, in fact, the men of pleasure; the eruditi the men of study. The apædeutæ preferred the modern writers to the ancient, to save themselves the trouble of studying the latter: the eruditi derided the moderns, and valued themselves wholly on their acquaintance with the ancients.

APÆDUSIA; from *α*, and *παιδεια*, instruction; ignorance or unskilfulness in what relates to learning and the sciences.

APAGMA, a term used by some writers in chirurgery, for the thrusting of a bone, or other part, out of its proper place. But it is more properly used for a fracture of a bone at or near the part where it is articulated with another.

APAGOGE; from *απο*, and *αγω*, I bear; in the ancient Athenian law, the carrying a criminal to the magistrate. If the accuser was not able to bring him to the magistrate, it was usual to take the magistrate to the house where the criminal lay concealed, or defended himself.

Apagoge, in mathematics, is sometimes used to denote a progress or passage from one proposition to another; when the first, having been once demonstrated, is afterwards employed in the proving of others.

APAGOGICAL; *απαγωγη*; from *απο*, and *αγω*, to lead away. See its application in the following citations.

If this be not admitted, I demand a reason why any other *apagogical* demonstration, or demonstration ad absurdum, should be admitted in geometry rather than this; or that some real difference be assigned between this and others, as such.

Berkeley's Works. Analyst.

There are two sorts of mathematical demonstration. The one is called direct, and takes place when a conclusion is inferred from principles which render it necessarily true: and this, though a more perfect or more simple sort of truth, is not more convincing than the other; which is called indirect, *apagogical*, reducens ad absurdum, and which takes place, when, by supposing a given proposition false, we are necessarily led into absurdity. *Beattie's Moral Science*, vol. ii.

APAKOOKIT, a town in the district of Quedah, Malay peninsula, six miles south-east from Allestar, inhabited chiefly by Chuliass. The soil is sandy and light, but produces abundance of grain.

APALACHE Bay, a bay in the Gulf of Mexico. Long. 84° 30′ W., lat. 29° 50′ N.

APALACHES, or St. Mark's River, a river of North America, rising in East Florida, in north latitude 31° 30′, near the north-west source of Great Satilla river, running south-west through the Apalachy country into the bay of Apalachy in the gulf of Mexico, about fifteen miles below St. Mark's. Its course is about 135 miles, and it falls into the bay near the mouth of the Apalachicola river.

APALACHIAN Mountains. See Allegany Mountains.

APALACHICOLA, a river of America, running between East and West Florida, which, after a course of 300 miles, falls into the gulf of Mexico at Cape Blaize.

APALACHINE, in botany, a name given by some authors to the shrub cassine vera Floridanorum of other writers. This plant is used as tea, and much celebrated.

APALACHY Country extends across Flint and Apalaches rivers in East Florida, having the Seminole country on the north-east. Apalachy or Apalachia is also the name of a town and harbour in Florida, ninety miles east of Pensacola, and the same distance west from Del Spiritu Santo River. The tribes of the Apalachian Indians lie round it.

APALUS, in entomology, a genus of the coleoptera order. There is but one species, the A. bimaculatus, or pyrochroa bimaculata of Degeer; found early in the spring in the sandy parts of Sweden.

APAME, the daughter of Artabazus the Persian, wife of Seleucus Nicator, and mother of Antiochus Soter king of Syria.

APAMEA, or Apamia, a city of Bithynia, formerly called Myrlea, from Myrlus, general of the Colophonians; destroyed by Philip VI. king of Macedon, and given to his ally Prusias, who rebuilt it, and called it Apamea, from the name of his queen Apama. Stephanus says, that Nicomedus Epiphanes, son of Prusias, called it after his mother; and that it had its ancient name from Myrlea, an Amazon. The Romans led a colony thither, called Colonea Apamena.

Apamea, called also Cibotos, a city of Phrygia, seated at some distance from the Meander, or, as would seem from a coin of Tiberius, on the Meander; so named from Apame, the daughter of Artabazus. The rise of Apamea was owing to the ruin of Celenæ.

Apamea, now called Famia, a strong city of Syria, below the confluence of the Orontes and Marsyas; situated in a peninsula formed by the Orontes, and a lake. 'It was here,' says Strabo, 'that the Seleucidæ had established the school and nursery of their cavalry.' The soil of the neighbourhood, abounding in pasturage, fed no less than 30,000 mares, 300 stallions, and 500 elephants; instead of which, the marshes of Famia at present scarcely afford a few buffaloes and sheep. To the veteran soldiers of Alexander, who here reposed after their victories, have succeeded wretched peasants, who live in perpetual dread of the oppressions of the Turks and the inroads of the Arabs. Such are the effects of despotism and ignorance.

APANAGE, or Apennage, in the ci-devant French customs, lands assigned by a sovereign for the subsistence of younger sons, which reverted to the crown upon the failure of male issue in that branch to which the lands were granted.

APANORMIA, a populous town and promontory on the north-west coast of the Turkish island of Santorin, in the Archipelago, six miles N.N.W. of Scaro. Small vessels cannot anchor in the harbour of this town on account of the

extreme depth of the water. Long. 25° 24′ E., lat. 36° 38′ N.

APANTHROPY, in medicine, denotes a love of solitude, and aversion for the company of mankind. Apanthropy is reckoned among the species or degrees of melancholy; and also passes for an ill indication in leucophlegmatic cases.

APARGIA, a genus of the class and order syngenesia polygamia æqualis. The essential character is: CAL. subimbricate, with linear, parallel, unequal scales: DOWN plumose, subsessile: RECEPTACLE naked, subvillose. There are seven species so much resembling the dandelion that they were formerly confounded. See HEDYPNOIS.

APARINE; from *ρινη*, a file; because its bark rasps like a file. Cleavers, or goose-grass. This plant, which is common in our hedges and ditches, is the galium aparine; carinatis scabris retrorsum aculeatis, geniculis venosis, fructu hispido, of Linnæus. The juice has been given with advantage as an aperient and diuretic in incipient dropsies; but the character in which it has of late been chiefly esteemed is that of an anticarcinomatous remedy. A tea-cup full, gradually increased to half a pint two or three times a day, is said to be good in cancers.

APARITHMESIS; from *απαριθμεω*, I number; in rhetoric, is a figure whereby that which might be expressed in few words is branched out into several particulars, by means of the particles firstly, then, or moreover, finally, &c.

APART', APART'MENT. In part, a part distinct from another part, or the remainder. Aside, unconnected, not in contact. Apartment, a division defined by some distinct boundary; applied to a suite of rooms. Lodgings.

For *aparti* we knowen, and *aparti* we proficien, but whame that schal bee that is parfaite, that thing that is of *parti* schal be auoided.

Wiclif. 1 *Corynth.* ch. xiii.

I never sawe my lady laye *apart*
Her cornet blacke, in colde, nor yet in heate,
Sith fyrst she knew my grief was growen so greate.

Surrey. p. 328.

So please you, madam,
To put *apart* these your attendants. *Shakspeare.*

He is so very figurative, that he requires a grammar *apart* to construe him. *Dryden.*

The tyrant shall demand yon sacred load,
And gold and vessels, set *apart* for God. *Prior.*

Since I enter into that question, it behoveth me to give reason for my opinion, with circumspection; because I walk aside, and in a way *apart* from the multitude. *Raleigh.*

The party discerned that the earl of Essex would never serve their turn; they resolved to have another army *apart*, that should be at their devotion.

Clarendon.

A private gallery 'twixt th' *apartments* led,
Not to the foe yet known. *Sir J. Denham.*

A massy portcullis gate leads to the ruins of what was once the habitable part of the castle, in which a large vaulted hall is the most remarkable *aparement*.

Gilpin's Tour to the Lakes.

APARTEMENUS, or APARTISMENUS, in the ancient poetry, an appellation given to a verse which comprehended an entire sense or sentence in itself.

APATE, in entomology, a genus of coleopterous insects in the Fabrician system: the character of which is, that they have filiform feelers; one tooth in each jaw; membranaceous lip; and perfoliated antennæ. This genus includes some of the Linnæan dermestes, as capucinus and domesticus.

AP'ATHY, APATHET'IC, APATHIS'TICAL. *Απαθεια*; *α*, privative, and *παθος*, feeling. Want of feeling; absence of passion; insensibility.

What is called by the stoics *apathy*, or dispassion; by the sceptics indisturbance; by the Molinists quietism; by common men peace of conscience; seems all to mean but great tranquillity of mind.

Sir Wm. Temple's Works.

Of good and evil much they argued them,
Passion and *apathy*, glory and shame. *Milton.*

To remain insensible of such provocation, is not constancy, but *apathy*. *South.*

In lazy *apathy* let stoics boast
Their virtue fix'd; 'tis fixed as in frost,
Contracted all, retiring to the breast;
But strength of mind is exercise, not rest. *Pope.*

I am not to be *apathetic* like a statue.

Harris on Happiness.

Fontenelle was of a good-humored and *apathetical* disposition. *Seward's Anecdotes.*

APATHY, among the ancient philosophers, implied an utter privation of passion, and an insensibility to pain. The stoics affected an entire apathy: they considered it as the highest wisdom to maintain perfect calmness and tranquillity of mind, incapable of being ruffled either by pleasure or pain. In the first ages of the church the Christians adopted the term apathy to express a contempt of all earthly concerns, or a state of mortification. Quietism is only another name for apathy disguised under the appearance of devotion.

APATIT, a mineral, divided by the German mineralogists into two varieties, the crystallised and earthy. The usual color of the crystallised is some combination of the colors green, blue, and red; that of the earthy a yellowish or grayish white. More than ninety parts in a hundred of this mineral consist of lime and phosphoric acid. It is found in Saxony, Bohemia, and Spain. It is the phospholite of Kirwan.

APATURIA; from *απατη*, fraud; in antiquity, a solemn feast celebrated by the Athenians in honor of Bacchus. It is said to have been instituted in memory of a fraudulent victory obtained by Melanthus, king of Athens, over Xanthus, king of Bœotia, in a single combat, which they agreed upon to put an end to a debate between them relating to the frontiers of their countries. Hence Budæus calls it festum deceptionis, 'the feast of deceit.' This feast lasted four days: the first day those of the same tribe made merry together; and this they called *δορπια*. The second day, which they called *αναρρυσις*, they sacrificed to Jupiter and Minerva. The third day, which they called *κουρεωτις*, such of their young men and maids as were of age were admitted into their tribes. The fourth day they called *επιβδης*.

APAULETERIA, in antiquity, a garment presented by the bride to the bridegroom on the second or third day of a marriage.

APAULIA, in antiquity, the third day of a marriage solemnity. It was thus called, because

the bride, returning to her father's house, did *απαυλιζεσθαι τω νυμφιω*, lodge apart from the bridegroom. On that day the bride presented her bridegroom with a garment, called *απαυλητηρια*.

APAUME, in heraldry, a hand opened, and a full palm appearing, with the thumb and fingers extended. It is seen in the arms of a baronet of England.

APE', APE'ISH, APE'ISHLY, APE'ISHNESS. A word supposed to be vernacular in the country from which the animal so called originally came. By others derived from the German *aben*, to imitate, from the well-known propensity of apes.

Sith it is no new thinge a fonde *ape* to make mockes and mowes, I wyl as I say leaue of thys felowes folishe *apishenesse*, and I shall goe to the matter self.
Sir Thos. More's Works, fol. 736. ch. i.

But this is a meruail that this good religiouse parishioners at Easter time do seke some by chappel, or some mock christian mōk whiche may prepare and deliuer vnto them the *apish* and coūtrefet supper.
Caluyne.

I will be more newfangled than an *ape*; more giddy in my desires than a monkey. *Shakspeare.*

Writers report, that the heart of an *ape* worn near the heart, comforteth the heart, and increaseth audacity. It is true that the *ape* is a merry and bold beast. *Bacon.*

With glittering gold and sparkling gems they shine;
But *apes* and monkeys are the gods within. *Granville.*

Celestial beings, when of late they saw
A mortal man unfold all nature's law,
Admir'd such knowledge in a human shape,
And show'd a Newton, as we show an *ape*. *Pope.*

Fashion, leader of a chattering train,
Whom man for his own hurt permits to reign;
Who shifts and changes all things but his shape,
And would degrade her votary to an *ape*;
And, when accomplished in her wayward school,
Calls gentleman, whom she has made a fool.
Cowper.

APE, in zoology, the general English name of a very numerous race of animals, comprehending apes properly so called, or such as want tails; and monkeys and baboons, or such as have tails, the former long, and the other short ones. See SIMIA.

APE, SEA, a name given by Steller to a marine animal which he saw on the coast of America.

APECHEMA, *απεχημα*, in medicine, the same with contrafissure.

APEE, one of the new Hebrides in the South Sea, near Mallicolo, of considerable height from the sea, and beautifully diversified with wood and herbage. It is 24 miles long, and about 60 in circumference. Long. 168° 32′ E., lat. 16° 42′ N.

APEEK, in navigation, a term to express the tightness of the cable bringing the vessel right on the anchor.

APELLA, among physicians, a name given to those whose prepuce is either wanting or shrunk, so that it can no longer cover the glans. Many authors have supposed this sense of the word apella warranted from the passage in Horace, credat Judæus Apella, Non ego.

APELLES, one of the most celebrated painters of antiquity. He was born in the Isle of Cos, and flourished in the time of Alexander the Great, with whom he was in great favor. He executed a picture of this prince holding a thunderbolt in his hand; a piece finished with so much skill and dexterity, that it used to be said there were two Alexanders; one invincible, the son of Philip; the other inimitable, the production of Apelles. It is well known also that Alexander forbade any one to paint his portrait beside Apelles. Alexander having employed him to draw Campaspe, one of his mistresses, and found that he had conceived an affection for her, he resigned her to him; and it was from her, as a model, that Apelles is said to have drawn his Venus Anadyomene. Grace was the characteristic of this artist. His pencil was so famous for drawing fine lines, that Protogenes discovered by a single line that Apelles had been at his house. Protogenes lived at Rhodes: Apelles sailed thither, and went to his house with great eagerness, to see the works of an artist who was known to him only by that name. Protogenes was gone from home; but an old woman was left watching a large piece of canvas, which was fitted in a frame for painting. She told Apelles that Protogenes was gone out; and asked him his name, that she might inform her master who had inquired for him. 'Tell him,' says Apelles, 'he was inquired for by this person;' at the same time, taking up a pencil, he drew on the canvas a line of great delicacy. When Protogenes returned, the old woman acquainted him with what had happened. The artist, upon contemplating the fine stroke of the line, immediately pronounced that Apelles had been there; for so finished a work could be produced by no other person. Protogenes, however, himself drew a finer line of another color; and, as he was going away, ordered the old woman to show that line to Apelles if he came again, and say, 'This is the person for whom you are inquiring.' Apelles returned, and saw the line: he would not for shame be overcome; and, therefore, in a color different from either of the former, he drew some lines so exquisitely delicate, that it was utterly impossible for finer strokes to be made. Protogenes now confessed the superiority of Apelles, flew to the harbour in search of him, and resolved to leave the canvas with the lines on it, for the astonishment of future artists. An intimate friendship subsisted ever after between Apelles and Protogenes, a thing of rare occurrence in the history of rivals. But Apelles was incapable of jealousy or envy. He acknowledged that Protogenes was in some respects superior to himself; but that in one particular himself excelled, viz. in knowing when to take his hand from the picture; an art which Protogenes had not yet learned, and therefore over-worked his pieces. Apelles equally disapproved of too elaborate diligence, or too hasty negligence in execution. A studied work of Protogenes he esteemed less on the one account; and on the other, when a painter once brought him a picture, and said, 'This I painted in a hurry;' he replied, 'Though you had not told me so, I perceived it was painted in haste; but I wonder you could not execute more such pieces in the same time.' It was customary with Apelles to expose to public view the works which he had finished,

and to hide himself behind the picture, in order to hear the remarks passed on it by persons who chanced to view it. He once overheard himself blamed by a shoemaker, for a fault in the slippers of some picture: he corrected the fault which the man had noticed: but, on the day following, the shoemaker began to animadvert on the leg; upon which, Apelles, with some anger, looked out from behind the canvas, and bade him keep to his own province; 'Ne sutor ultra crepidam.' A remarkable proof is given of this painter's freedom in expressing the mortification he felt, when a work of his was not sufficiently commended. 'Alexander,' says Ælian, 'having viewed the picture of himself, which was at Ephesus, did not praise it as it deserved. But when a horse was brought in, and neighed at seeing the figure of a horse in the picture, as though it had been a real horse; 'O king!' said Apelles, 'this horse seems to be by far a better judge of painting than you.' In finishing a drawing of this animal, a remarkable circumstance is related of him. He had painted a horse returning from battle, and had succeeded to his wishes, in describing every other mark that could indicate a mettlesome steed, impatient of restraint; there was wanting nothing but a foam of a bloody hue, issuing from the mouth. He again and again endeavoured to express this, but his attempts were unsuccessful. At last, with vexation, he threw against the reins of the horse a sponge, which had in it many colours; a mixture of which coming out of the sponge, and tinging the reins, produced the very effect desired by the painter. The most celebrated of the works of Apelles were the picture of Alexander in the temple of Diana at Ephesus, and that of Venus emerging from the sea. Alexander was drawn with thunder in his hand; and such relief was produced by the chiaroscuro in this piece, that the finger seemed to shoot forward, and the thunder-bolt to be out of the picture. His Venus Αναδυομενη was esteemed the most exquisite figure which the pencil could create.

Apelles, a heretic, who flourished about A. D. 178, who taught that there was a good and a bad principle; denied the resurrection; and pretended that the prophets contradicted each other; and that Christ, having received his body from the elements, left it dissolved in the air, and ascended into heaven without one!

Apelles, in entomology, a species of scarabæus, found at the Cape of Good Hope. Also, a species of hespericæ, one of the papilio pleb. rural. of Linnæus, a native of New Holland.

APELLICON, a peripatetic philosopher, to whom the world is, in a great measure, indebted for the works of Aristotle; he having purchased them at a very high price about ninety years before Christ. He brought his purchase from Scepsis to Athens, where he caused the MSS. to be copied. They were afterwards seized by Scylla, and carried to Rome.

APELMAN (Barent), a Dutch painter, born at the Hague in 1640. He excelled in painting landscapes; his scenes are mostly taken from views about Rome and other parts of Italy; the figures in his pieces are but indifferent. On his return to Holland, he was employed by the Prince of Orange; in the hall of whose palace at Soesdyck are several of his landscapes, and a few of his best portraits. He died in 1686.

APENE, απηνη, chariot, in antiquity; a kind of chariot, wherein the images of the gods were carried in procession on certain days, attended with a solemn pomp, songs, hymns, dancing, &c. The apene, or sacred chariot of the Greeks, is called tensa. It was very rich, made of ivory or silver, and variously decorated.

APENNINUS. See Appennines.

APENNIS, in ancient laws, a deed or instrument made in favor of a person, who has lost the title-deed to his house or land, by fire, or other accident. In such case an assembly of the people of the neighbourhood being called, and an exact enquiry being made before the judge, another instrument was framed, to confirm and secure the person's right.

APENRADE, a town of Denmark, in the duchy of Sleswick, seated at the bottom of a gulph in the Baltic Sea, between Flensbourg and Hadashleben, twenty-six miles north from Sleswick. Long. 9° 26′. E, lat. 55° 3′ N.

APENZEL. See Appenzel.

APEPSY, a defect in the stomach, which prevents the aliment taken in from affording a proper chyle for supplying the blood, and nourishing the body. Abstemiousness and excess are alike causes of indigestion. The method of treatment in the apepsy is the same as in the anorexy.

APER (Marcus), a Roman orator of the first century. Some writers have attributed to him the 'Dialogue of Orators,' which has been frequently printed with the works of Tacitus and Quintilian. He died about 83.

Aper, in ichthyology, the name of a sea-fish, called by some strivale and riondo. It approaches very much in shape to the dory, but is much smaller.

Aper, in zoology, a synomyme of the sus scrofa.

Aper Moschiferus, a name by which many authors have called the tajacu of America.

Aper Piscis, a name by which some authors have called the capriscus.

APEREA, in zoology, a small American animal, of the rabbit kind, and seeming to be of a mixed nature between the rabbit and the mouse having exactly the short roundish ears of the mouse, and all the other particulars of the rabbit. It grows, at its full size, to ten or twelve inches long and its hair is of the color of the hare on the back and sides, and whitish on the belly.

APERIENS, Crocus Martis, saffron of iron, a preparation of iron plates or filings, made by exposing them to the rain or dew, till they contract a rust; which is reckoned a fine aperient medicine.

Aperiens Palpebram Rectus, a name given by some anatomists to the levator palpebræ superioris. See Anatomy.

APERIENTS, in the materia medica, are medicines that facilitate the circulation of the humors by removing obstructions. The five aperient roots of the shops are smallage, fennel, asparagus, parsley, and butcher's broom. The

five lesser aperients are, madder, grass, eryngo, capers and chammoc.

APERISTATION; from *a*, without, and *περισασις*, unfavorable circumstance; in the ancient physic, denotes a mild ulcer, not attended with any severe symptom.

APERT', APER'TION, APERT'LY, APERT'NESS, APERTURE. } *Aperio, apertum; ad*, and *pario*, to bring forward, or into view. Public, unconcealed. All the included words are obsolete, excepting the last word, which signifies an opening, and is usually confined to physical space.

Holi churche, quath Pandulf, so rıtzuol is and was,
That he ne sal no prelat sette adoun without *aperte* trespas. *R. Gloucester*, p. 501.

Si þen he went to Durham and gaf Saynt Cuthbert, Londes and liþes with chartir *aperte*.
R. Brunne, p. 29.

Thus seest thou *apertly* thy sorrowe into wele mote ben chaunged, wherefore in such case to better euermore encline thou shouldest.
Chaucer. Test of Love, bk. ii. fol. 304. ch. i.

Whiche asketh not to ben *apert*,
But in silence and in couert
Desyreth for to be beshaded.
Gower. Con. A. bk. iv. p. 119.

An aperture in the mountains brought us into another wild recess.
Gilpin's Tour to the Lakes of Cumberland, &c.

The freedom or *apertness*, or vigour of pronouncing, and the closeness of muffling, and laziness of speaking, render the sound different. *Holder.*

The plenitude of vessels, otherwise called the plenora, when it happens, causeth an extravasation of blood, either by ruption or *apertion* of them.
Wiseman.

APERTIONS, in architecture, are the openings in a building; as doors, windows, stairises, chimneys, outlets and inlets for light, moke, &c. The apertions should be as few as ay be; it being a rule, that all openings are eakenings; and they should not approach too ar the angles of the walls.

APERTOR OCULI, in anatomy, a name given Spigelius to the levator palpebræ superioris.

APERTURA FEUDI denotes the loss of a dal tenure, by default of issue to him to whom e feud or fee was first granted.

APERTURA TABULARUM, in ancient law books, nifies the breaking open a will.

APERTURE, in geometry, the space between o right lines which meet in a point and form angle.

APERTURE, in optics, a round hole in a turned of wood, or plate of tin, placed within the e of a telescope or microscope, near to the ject-glass, by means of which more rays are mitted, and a more distinct appearance of the ject is obtained. According to Huygens, the e of the aperture of an object-glass of thirty t is as thirty to three; i. e. as ten to one, so is the are root of the focal distance of any lens, mulied by thirty to its proper aperture. Mr. Aout s, he found the proper apertures of telepes ought to be nearly in the sub-duplicate o of their length. Object-glasses, however, l admit of greater apertures, if the tubes are ckened on the inside, and their passage furbed with wooden ring.

APEUCTIC; from *απευχομαι*, I deprecate; in ancient poetry, a kind of poem or prayer preferred to the Deity for the averting some evil.

A'PEX; from the obsolete *apere, vinculo comprehendere;* a kind of cap ending in a pointed top, such as was worn by the priests of Mars, called salii. It very nearly resembled the mitres of our bishops. Figuratively, and in its general sense, the top, summit, highest degree, of any thing.

APEX, in antiquity, the crest of a helmet, but more especially a kind of cap worn by the Flamens.

APEX is used, by grammarians, for a long accent or mark, to denote that a syllable is to be pronounced long. See ACCENT.

APHACA, in ancient geography, a town in Syria, situated between Heliopolis and Byblus, near Lebanon; celebrated for a temple of Venus called Aphacitis, near which was a lake round which fire usually burst forth, and its waters were so heavy that bodies floated on them. The temple was destroyed by Constantine, as being a school of incontinence.

APHÆRESIS, *αφαιρεσις*; a figure in grammar that takes away a letter or syllable from the beginning of a word.

APHÆRESIS, in medicine, denotes a necessary taking away or removal of something that is noxious. In surgery it signifies an operation whereby something superfluous is taken away.

APHANES, a genus of the monogynia order, and tetandria class of plants, and, in the natural order, senticosæ. The essential characters are: CAL. divided into eight parts: COR. none: SEEDS two, and naked. There is only one species: A. arvensis, or parsley-piert, a native of Britain. It is extremely common in corn-fields. The stalks rise five or six together; they are three inches long, hairy, and procumbent: the leaves stand very thick upon them, and are roundish, but divided, as it were, into three parts, and those deeply serrated at the edges. The flowers come out in a double series, arranged all along the branches, and are of a greenish white, and the whole plant is of a grayish or whitish green color.

APHANITE, the name given by Haüy to a compound rock, in which amphibole is the predominant principle. It is a green-stone, the distinction of whose parts is indiscernible. Aphanite is included by older mineralogists among the rock called cornèennes, or lapis corneus trapezius.

APHASIA; from *α*, and *φημι*, I speak; in the sceptic philosophy, denotes a state of doubt. In this sense, aphasia stands opposed to phasis, under which are included both assertion and negation.

APHELANDRIA, in botany, a genus of plants discovered by Mr. Brown. They derive their name from *αφελης*, simple, and *ανηρ*, a male, expressing the simple structure, or single cell, of the antheræ, one of the most distinguishing characters of this genus. Class, didynamia; order, angiospermia. Natural order, personatæ, Linn.; acanthi, Juss.; acanthaceæ, Brown. Its general characters are: CAL. perianth inferior, one leaf, in five erect segments: COR. one petal.

limb in two unequal acute lips: STAM. filaments four, erect, inserted into the tube of the corolla, two long; antheræ incumbent, acute at each end, of one cell: PIST. germ superior, ovate; style thread-shaped; stigma simple: PERIC. capsule oblong, two cells: SEEDS two in each cell, roundish. Its essential characters are: CAL. five deep unequal segments: COR. lower lip undivided: ANTHERÆ single-celled; capsule bivalved, and with two cells: SEEDS subtended by spines. 1. A. cristata. Dense-spiked aphelandria; a native of Cayenne and the Caraccas. 2. A. pulcherrima, downy-leaved aphelandria; a native of South America. 3. A. scabra, rough-leaved aphelandria, a native of South America.

APHELIA; from *αφελης*, simple; in rhetoric, simplicity of diction.

APHELIA, so called from *αφελης*, simple, in allusion to the great simplicity of the structure of the flower. Class, monandria; order, monogynia. Natural order, restiaceæ, Brown. Its generic characters are: CAL. sheath of several imbricated scales; the lower ones longer than the rest: COR. one membranous valve; STAM. one capillary filament; simple anther: PIST. germ. single-seeded; one, thread-shaped style; stigma solitary and undivided: PERIC. membranous capsule, one valve, and one cell: SEED solitary. Its essential characters are: scales two-ranked, single-flowered: COR. one valve: ANTHER simple: STIGMA one: CAPSULE bursting longitudinally, at one side: SEED solitary. There is but one known species: A. cyperoides cyperus, spiked aphelia, a native of the south of New Holland.

APHELION; from *απο*, and *ηλιος*, the sun; that part of the orbit, or planet, in which it is at the point remotest from the sun. This also applies to a satellite; for the moon has her aphelia as well as the planets.

APHERNOUSLI, a species of pine growing wild on the Alps. The timber is large, and the planks made of it are of a finer grain, and more beautifully variegated, than common deal; and may therefore be applied to many uses. It grows in bleak and barren ground, and most resembles that which is called in England the Weymouth pine.

APHESIS; from *αφιημι*, I remit; in the Athenian laws, was applied to the case of a person deeply indebted, who desired the people to remit part of the debt, on account of his disability to make payment.

APHETERIA, in the ancient military art, a kind of engines used in the besieging of towns. Suidas does not mention their particular form or structure. Aquinas takes them to have been of the projectile kind.

APHILANTHROPY. See APANTHROPY.

APHIOCEM, a composition made principally of the buds of hemp before they flower. It is much in use among the Arabs, and has the intoxicating quality of opium.

APHIOM, APHIOU, or APHIUM, Karahissart, a town of Natolia, in Asiatic Turkey; so named because it produces a great quantity of opium, called aphium by the Turks. It was formerly the patrimony of Othman, the founder of the Turkish monarchy. This town is three miles in circuit, surrounded by walls, and defended by a castle surmounting a rock of prodigious height. The principal article of commerce is opium, which is obtained from incisions of the head of the white poppy. This plant is raised from seed sown in gardens round the town, and then transferred to more extensive fields. Small transverse slits are made in July, and continued to the end of summer, which occasion the exudation of a milky juice, soon growing brown, and acquiring more consistence. Population 60,000. Long. 30° 18′ E., lat. 38° 46′ N.

APHIS, in entomology, an interesting and very extensive genus of insects of the Linnæan order hemiptera; called also plant-louse, vine-fretter, puceron, &c. The great Swedish naturalist defines the generic character of the aphis, thus:—beak inflected, sheath of five articulations, with a single bristle; antennæ setaceous, and longer than the thorax; either four erect wings, or none; feet formed for walking; posterior part of the abdomen usually furnished with two little horns. Geoffroy says the aphides have two beaks, one of which is seated in the breast, the other in the head; this last extends to, and is laid upon the base of, the pectoral one; and serves, as that writer imagines, to convey to the head a part of that nourishment which the insect takes, or sucks in, by means of the pectoral beak. The species enumerated by Linnæus and Gmelin are: longirostris ribis, arundinis, ulmi, papaveris, pastinacæ, pruni, sambuci, solidaginis, cerasi, rumicis, acetosæ, ligustici, lychnidis, capreæ, padi, rosæ, hortensis, picridis, ægopodii, dauci, urticata, nymphææ, corni, tiliæ, juniperi, brassicæ, craccæ, lactucæ, sonchi, cirsii, cardui, achilleæ, tanaceti, absinthii, millefolii, evonymi, avenæ, fraxini, jaceæ, betulæ, alni, roboris, fagi, quercus, pini, pineti, salicis, vitis, populi, tremulæ, viburni, mali, bursaria aparines, urticæ, aceris, atriplicis, pistaciæ, persicæ, polyanthis, saligna, plantaginis, archangelicæ, leucanthemi, scabiosæ, fabæ, genistæ, coryli, juglandis, balsamitæ, gallarum, farinosa, xylostei, and mayeri. The whole of these are found in Europe, and infest an endless variety of plants. It has been generally believed that each species is attached to one kind of vegetable only; hence these insects have been hitherto named after the species, or genus of plants, on which it feeds, or has been found; for some species are rather uncommon and little known. They abound with a sweet and grateful moisture, and are therefore eagerly devoured by ants, the larva of coccinellæ, and many other creatures, or they would become very probably more destructive to the whole vegetable creation than any other race of insects. The production of this moisture, generally called honey-dew, and their equivocal generation, are the circumstances which have attracted the particular attention of modern naturalists, and in which they seem to be distinguished from all other parts of the animal world.

They had long been considered among the true androgynes; and if Bonnet was not the first naturalist who discovered the mysterious course of their generation, his experiments, together with those of his countryman Trembley

tended to confirm, in the most satisfactory manner, its almost incredible circumstances. He shut up a young aphis, at the instant of its birth, in the most perfect solitude, and it brought forth in his sight ninety-five young ones. The same experiment being made on one of the individuals of this new family, it soon multiplied like its parent; and one of this third generation, in like manner brought up in solitude, proved no less fruitful than the former. Repeated experiments in this respect, as far as the fifth or sixth generation, all uniformly presenting the observer with fecund virgins, were communicated to the Royal Academy of Sciences; when an unforeseen and very strange suspicion, imparted by Mr. Trembley to Mr. Bonnet, engaged him anew in a series of experiments on the habits of this wonderful creature. In a letter from the Hague, dated 27th Jannary, 1741, his friend wrote thus: 'I formed, since the month of November, the design of rearing several generations of solitary pucerons, in order to see if they would all equally bring forth. In cases so remote from usual circumstances, it is allowed to try all sorts of means; and I argued with myself—who knows but that one copulation might serve for several generations? This 'who knows,' avouching nothing, was sufficient, however, to induce Mr. Bonnet to bring the matter to the test of experiment. If the fecundity of aphides was owing to the secret copulation suggested by Mr. Trembley, his previous experiment proved that it served at least five or more successive generations. Mr. Bonnet therefore now reared to the amount of the tenth generation of solitary aphides, and had the patience to keep an account of the days and hours of the births of each. In short, it was discovered, that they are really distinguished by sexes: that there are males and females among them, whose amours are the least equivocal of any in the world: that the males are produced only in the tenth generation, and are but few in number; that these, soon arriving at their full growth, copulate with the females; that the virtue of this copulation is not exhausted at least until the tenth generation; that all these generations, except the first from the fecundated eggs, are produced viviparous; and all the individuals are females, except those of the last generation, among whom, as we have already observed, some males make their appearance, to lay the foundations of a fresh series. These circumstances have been confirmed by other naturalists. In particular, we have a curious and accurate detail of them by Dr. Richardson of Rippon, in the Philosophical Transactions, vol. xi. art. 22, an extract of which we shall here insert, in order to give the reader as full an insight into the nature of these singular insects as can be done by a mere detail of facts in themselves utterly unaccountable. Mr. Curtis has also contributed an excellent paper on this subject to the Linnæan society. Vide Transactions of Linn. Soc. vol. vi.

Dr. Richardson says, the great variety of species which occur in the insects now under consideration, may make an enquiry into their particular nature seem not a little perplexed: having them, however, skilfully reduced under their proper genus, the difficulty is, by this means, considerably diminished. All the insects comprehended under any distinct genus, we may reasonably suppose to partake of one general nature; and, by diligently examining any of the particular species, may thence gain some insight into the nature of all the rest. With this view I have chosen, out of the various sorts of aphides, the largest of those found on the rose tree; not only as its size makes it the more conspicuous, but as there are few others of so long duration. This sort, appearing early in the spring, continues late in the autumn; while several are limited to a much shorter term, in conformity to the different trees and plants from whence they draw their nourishment. If, at the beginning of February, the weather happens to be so warm as to make the buds of the rose-tree swell and appear green, small aphides are frequently to be found upon them, not larger than the young ones in summer when first produced. But there being no old ones to be found at this time of the year, which in summer I had observed to be viviparous, I was formerly not a little perplexed by such appearances, and almost induced to give credit to the old doctrine of equivocal generation. That the same kind of animal should at one time of the year be viviparous, and at another time oviparous, was an opinion I could then by no means entertain. This, however, frequent observation has at last convinced me to be fact; having found those aphides which appear early in the spring to proceed from small black oval eggs, which were deposited on the last year's shoots in autumn; though, when it happens that the insects make too early an appearance, I have observed the greatest part to suffer from the sharp weather that usually succeeds, by which means the rose-trees are some years in a manner freed from them. Those which withstand the severity of the weather seldom come to their full growth before the month of April; at which time they usually begin to breed, after twice casting off their exuviæ or outward covering. It appears then that they are all females, which produce each of them a very numerous progeny, and that without having intercourse with any male insect. As I observed before, they are viviparous; and, what is equally uncommon, the young ones all come into the world backwards. When they first come from the parent they are enveloped by a thin membrane, having in this situation the appearance of an oval egg; which, I apprehend, must have induced Reaumur to suspect that the eggs discovered by Bonnet were nothing more than mere abortions. These egg-like appearances adhere by one extremity to the mother; while the young ones contained in them extend the other; by that means gradually drawing the ruptured membrane over the head and body to the hind feet. During this operation, and for some time after, by means of something glutinous, the fore part of the head adheres to the vent of the parent. Being thus suspended in the air, it soon frees itself from the membrane in which it was confined, and, after its limbs are a little strengthened, is set down on some tender shoot, and then left to provide for itself.' 'In the spring

months there appear on the rose-trees but two generations of aphides, including those which immediately proceed from the last year's eggs; the warmth of the summer adds so much to their fertility, that no less than five generations succeed one another in the interval. One is produced in May, which casts off its covering; while the months of June and July each supply two more, which cast off their covering three or four times, according to the different warmth of the season. This frequent change of the outward covering is the more extraordinary as it is the oftenest repeated when the insects come the soonest to their growth; which I have sometimes observed to happen in ten days, where warmth and plenty of nourishment have mutually conspired. From which considerations I am thoroughly convinced that these various coverings are not connate with the insect; but that they are, like the scarf-skin, successively produced. Early in the month of June some of the third generation, which were produced about the middle of May, after casting off their last covering, discover four erect wings, much longer than their bodies; and the same is observable in all the succeeding generations, which are produced during the summer months; without, however, distinguishing any diversity of sex, as is usual in several other kinds of insects. These winged ones have the peculiarity that the number of them does not seem so much to depend on their original structure as on the quantity or quality of the nourishment with which they are supplied; it being frequently observed that those on a succulent shoot have few or none with wings among them, while others of the same generation, on a less tender branch, are most of them winged; as if only the first rudiments of wings were composed in the former, while nature thought proper to expand them in the latter, that they might be more at liberty to supply their wants. The increase of these insects in the summer time is so very great, that, by wounding and exhausting the tender shoot, they would frequently suppress all vegetation, had they not many enemies to restrain them. To enumerate these would exceed the bounds of the present design: there is one, however, so singular in the manner of executing its purpose, that I cannot pass by it without some further notice. This is a very small black ichneumon fly, with a slender body, and very long antennæ, which darts its pointed tail into the bodies of aphides, at the same time depositing an egg in each. This egg produces a worm which feeds upon the containing insect till it attains its full growth; when it is usually changed to that kind of fly from whence it came. In this, however, it is sometimes prevented by another sort of small black fly, which wounds this worm through its pearl-like habitation; and by laying one of its eggs therein, instead of the former fly, produces its own likeness. I must, however, further observe, notwithstanding these insects have many enemies, they are not without friends; if we may consider those as such who were very officious in their attendance, for the good things they expect to reap thereby. The ant and the bee are both of this kind, collecting the honey in which the aphides abound; but, with this difference, that the ants are constant visitors, the bee only when flowers are scarce. To which let me also add, that the ants will suck in the delicious nectar while the aphides are in the act of discharging it from the anus; but the bees only collect it from the leaves on which this honey-dew has fallen.

'In the autumn I find three more generations of aphides to be produced; two of which make their appearance in the month of August, and the third usually appear before the middle of September. As the two first differ in no respect from those which we meet with in summer, it would be wasting time to dwell any longer upon them; but the third, differing greatly from all the rest, demands our giving it a more serious attention. Though all the aphides which have hitherto appeared were females, in this tenth generation are found several male insects; not that they are by any means so numerous as the females; being only produced by a small number of the former generation. To which I must further add, that I have observed those which produce males, previously to have produced a number of females which, in all respects resembling those already described, I shall decline taking into any further consideration. The females have at first altogether the same appearance with those of the former generation; but in a few days their color changes from a green to yellow, which is gradually converted into an orange color before they come to their full growth. They differ likewise in another respect, at least from those which occur in summer, that all those yellow females are without wings. The male insects are, however, still more remarkable, their outward appearance readily distinguishing them from the females of this and all other generations. When first produced they are not of a green color like the rest, but of a reddish brown; and have afterwards, when they begin to thicken about the breast, a dark line along the middle of the back. These male insects come to their full growth in about three weeks time, and then cast off their last covering; the whole insect being after this operation of a bright yellow color, the wings only excepted. But after this they soon change to a dark yellow, and in a few hours to a very dark brown; if we except the body, which is something lighter colored and has a reddish cast. They are all of the winged sort; and the wings, which are white at first, soon become transparent, and at length appear like very fine black gauze. The males no sooner come to maturity than they copulate with the females; in which act they are readily discovered as they remain in conjunction for a considerable time, and are not easily disturbed. The commerce between them continues the whole month of October, and may be observed at all times of the day, though I have found it most frequent about noon; especially when the weather is moderately warm, and the sun overcast. The males, in a day or two after their intercourse with the males, I have observed to lay their eggs; which they usually do near the buds, when they are left to their own choice. Where there are a number crowded together, they of course interfere with each other; in which case they will frequently

posit their eggs on other parts of the branches, or even on the spines with which they are beset.' The observations of Mr. Curtis are chiefly intended to show that the aphides are the principal cause of blights in plants, and the producers of honey-dew. After observing, that in point of number the individuals of the several species composing it surpass those of any other genus in the country, he says, 'These insects live intirely on vegetables. The loftiest tree is no less liable to their attack than the most humble plant. They prefer the young shoots on account of their tenderness; and, on this principle, often insinuate themselves into the very heart of the plant, and do irreparable mischief before they are discovered. But for the most part they beset the foliage, and are always found on the under side of the leaf, which they prefer, not only on account of its being most tender, but as it affords them protection from the weather, and various injuries to which they would otherwise be exposed. Sometimes the root is the object of their choice, which, from the nature of these insects, one would not, à priori, expect; yet I have seen the roots of lettuces thickly beset with them, and the whole crop rendered sickly and of little value; but such instances are rare. They rarely also attach themselves to the bark of trees, like the aphis salicis, which being one of our largest species, and hence possessing superior strength, is enabled to penetrate a substance harder than the leaves themselves.'

'In 1793 they were the chief, and in 1798 the sole cause of the failure of the crops of hops. In 1794, a season almost unparalleled for drought, the hop was perfectly free from them, while peas and beans, especially the former, suffered very much from their depredations. Beans in 1798 were almost wholly cut off by them; indeed, they suffer more or less every year by a black species of aphis, particularly the latter crops. To potatoes, and even corn, they prove in some years highly detrimental, and not less so to melons. To plants in stoves, green-houses, and frames, where, from the warmth and shelter afforded them, a preternatural multiplication takes place, they prove extremely injurious; and many rare and valuable plants also in the open ground of our botanic gardens fall victims to these general depredators. 'Seeing, therefore,' continues this writer, 'that our necessaries, as well as luxuries of life, are so materially affected by the insects of this genus, an attempt to ascertain some curious and important facts relative to their history, and to make them more generally known, will not, we trust, be unacceptable. Such inquiries lead to the means of obviating the injuries they occasion; and if they fail in this, they tend at least to correct the erroneous notions entertained of blights, not by the vulgar and illiterate merely, but even by persons of education, who may be frequently heard to maintain that these insects are brought by the east winds; that they attack none but sickly plants; with other notions, all as false in fact as unphilosophical in principle.' While locusts and caterpillars are furnished with strong jaws, by means of which they devour the foliage of plants the aphis destroys them in a different way. It is provided with a hollow-pointed proboscis, which, when the animal is not feeding, folds under the breast. With this instrument it pierces the plant, and imbibes its juice to support itself; it follows that, when these juices are drawn off, the plant, exhausted, flags and perishes, being, in fact, literally bled to death by these leech-like animalcules. It most commonly happens, that if they do not wholly destroy a plant, they deface it; and a small number of aphides is sufficient to produce this effect.'

But the excremental fluid voided by these insects is, perhaps, their most extraordinary peculiarity. Were a person accidentally to take up a book, in which it is asserted that in some countries there were animals which voided liquid sugar, he would lay it down, regarding it as a fabulous tale; yet such is literally the truth. Mr. Curtis collected this production on a piece of writing paper from a brood of the aphis salicis, and found it to be as sweet as sugar; and observes, that were it not for the wasps, ants, flies, and other insects, that devour it as quickly as it is produced, it might, no doubt, be collected in considerable quantities; and by the processes used with other saccharine juices, be converted into the choicest sugar or sugar-candy. The sweetness of this excrement, the glossy appearance it gave the leaves it fell upon, and the swarms of insects this matter attracts, led him first to imagine the honey-dew of plants was no other than this secretion, and further observation fully confirmed it; and he became convinced that it neither falls from the atmosphere, nor issues from the plant itself. If it fell from the atmosphere, it would cover every thing indiscriminately, whereas we never find it but on certain living plants and trees. We find it also on plants in stoves and green-houses covered with glass. If it exuded from the plant, it would appear, on all the leaves generally and uniformly; whereas its appearance is extremely irregular, not being alike on any two leaves of the same tree or plant, some having none of it, and others being covered with it but partially. As far as the writer's observations extended, there never exists any honey-dew but where there are aphides; though such often pass unnoticed, being hid on the underside of the leaf; and wherever honey-dew is observable upon a leaf, aphides will be found on the underside of the leaf or leaves immediately above it, and under no other circumstance whatever. If by accident any thing should intervene between the aphides and the leaf next beneath them, there will be no honey-dew on that leaf: and thus he conceives it is incontrovertibly proved that aphides are the true and only source of honey-dew.

It has been recommended as the best and surest method of extirpating aphides, to put on the trees infested with them some larvæ of the plant louse-lion, or aphidivorous flies. (See Coccinella, Ichneumon, Hemerobius, &c.) For those voracious larvæ destroy every day a great number of these insects, and that with so much more facility, as the latter remain quiet and motionless in the neighbourhood of these dangerous enemies, who range over heaps of plant-lice, which they gradually diminish and extirpate. Powders or liquids, however fatal to aphides, must ever

be ineffectual, from the trouble and difficulty of applying them, so that they may come in contact with the insects. The smoke of common vegetables, however powerful, is found inadequate to their destruction, and the only one yet employed with success is that of tobacco. In this they should be completely enveloped, which in greenhouses and stoves may be tolerably well accomplished. Mr. Louden speaks of fumigating bellows, employed for this purpose; and recommends excessive watering as another means of destroying aphides.

APHLASTUM; from *α* and *φλαστος*, frangible; in the ancient navigation, a wooden instrument, shaped like a plume of feathers, fastened on the goose's or swan's neck, used by the ancient Greeks in the heads of their ships. It seems also to have had this farther use, viz. by the waving of a party-colored ribband fastened to it, to indicate from what quarter the wind blew. The aphlastum was the proper ornament of the head, as the acrostolium was of the stern. The Greek aphlastum answered to, and was probably the origin of, the Latin apluster.

APHONIA, among physicians, signifies a suppression or total loss of voice from apoplexy, or any other such cause.

APH'ORISM, APH'ORISER, APH'ORIST. } *Αφορισμος, απο*, from, *οριζω*, to bound. 'The twofold act of circumscribing and detaching when it is exerted by the mind on subjects of reflection is to *aphorise*, and the result an *aphorism*.'—*Coleridge*. A sententious saying; an important doctrine concentrated in few words; a sagacious observation.

The writing in *aphorisms* hath many excellent virtues, whereto the writing in method doth not approach. *Bacon's Essays.*

Thaddeus Haggesius, in his Metoposcopia, hath certain *aphorisms* derived from Saturn's lines in the forehead, by which he collects a melancholy disposition. *Burton's Anatomy of Melancholy.*

Our appetites do prompt to industry, as inclining to things not attainable without it; according to that *aphorism* of the wise: The desire of the slothful killeth him, for his hands refuse to labor. *Barrow's Sermons.*

As this one *aphorism*, Jesus Christ is the Son of God, is virtually and eminently the whole gospel; so to confess or deny it is virtually to embrace or reject the whole round and series of gospel truths. *South.*

APHORISM; from *αφοριζω*, to separate or define; a sentence comprehending, within a few words, all the properties of a thing. Aphorisms are chiefly used in medicine and law, as the aphorisms of Hippocrates, of Boerhaave, &c.

APHRACTI; from *α*, and *φρακτος*, enclosed; in antiquity, denotes open vessels, furnished only at head and stern with cross planks, whereon the men stood to fight.

APHRITE. Earth foam or schaumerde. This carbonate of lime is usually found in a friable state; but sometimes solid. In color it is of a silvery white shining lustre, very soft, and easily cut. It is usually found in calcareous veins at Gera in Misnia, and Eisleben in Thuringia. It consists, according to Bucholz, of 51·5 lime, 39 acid, 1 water, 5·7 silica, 3·3 oxide of iron.

APHRODISIA, in antiquity, festivals in honor of the goddess *Αφροδιτη*, or Venus. There are several of these aphrodisia observed in divers parts of Greece; the most remarkable was that at Cyprus, first instituted by Cinyras, out of whose family certain priests of Venus were elected, and for that reason named *Κινυραδαι*. At this solemnity several mysterious rites were practised: all who were initiated to them offered a piece of money to Venus as a harlot, and received, as a token of the goddess's favor, a measure of salt, and a *φαλλος*; the former because salt is a concretion of sea-water, to which Venus was thought to owe her birth; the latter because she was the goddess of wantonness. Aphrodisia also signifies the age of puberty.

APHRODISIACE, a name given to a gem, supposed to have a power of procuring love to the person who wore it about him; according to Pliny it was of a pale-flesh color; but the stone is now wholly unknown.

APHRODISIUS, in chronology, denotes the eleventh month in the Bithynian year, commencing on the 25th of July.

APHRODITA, in zoology, an insect of the order vermes mollusca. The body of the aphrodita is oval, with many small tentacula or protuberances on each side, which serve as so many feet: the mouth is cylindrical, at one end of the body, and capable of being retracted, with two bristly tentacula. The eyes are four in number. There are four species of this insect, viz. 1. A. aculeata, by some called the sea-mouse, with thirty-two tentacula or feet, an inhabitant of the European seas, and often found in the belly of the cod-fish. It feeds upon shell-fish. 2. A. imbricata is very like the squamata, only its scales are more glabrous. It inhabits the Northern Ocean. 3. A. scabra, of an oblong shape, scabrous on the back, with twenty tentacula. It inhabits the Belgic Sea. It is sometimes taken off Brighthelmstone, an inch long. 4. A. squamata, with twenty-four feet, and scaly on the back. The mouth is wrapt up in an aperture, and the tail is terminated by a very few short bristles. It inhabits the European Ocean.

APHRODITARIUM, in ancient pharmacy, a medicine compounded of frankincense, the scales of copper, ceruss, starch, and pomegranates, mixed in equal quantities. The name is also given to a kind of collyrium mentioned by Galen.

APHRODITE, in mythology, a name of Venus, derived from *αφρος*, froth; because, according to the poets, Venus is supposed to have been produced from the froth of the sea.

APHRODITES, in natural history, a name given by some authors to the finest species of amethyst. See AMETHYST.

APHROGALA; from *αφρος*, froth, and *γαλα*, milk; in ancient physic, milk converted into froth; recommended by Galen in inflammatory disorders of the stomach.

APHROLITRUM, in ancient physic, the froth of nitre.

APHRONITRE; from *αφρος*, and *νιτρον*, nitre; a kind of nitre, mentioned by the ancients, supposed to be the lightest part thereof, emerging to the top. Some modern naturalists rather take the ancient aphronitre to have been a native salt-petre, now called salt-petre of the rock. Greek

authors expressed two different substances by the word aphronitrum; the one the native nitre of those ages; and the other the spume of the vessels in which they purified their nitre. Galen plainly tells us that these were two different substances.

APHROSELENOS, among ancient naturalists, a denomination given to the selenites, or lapis specularis.

APHTHÆ, in medicine, small, round, and superficial ulcers arising in the mouth. See MEDICINE.

APHTHARTODOCETÆ; from *αφθαρτος*, incorruptible, and *δοκεω*, to imagine; a sect who held that the body of Jesus Christ was incorruptible, impassible, and not capable of death. They arose among the Eutychians, and made their first appearance in the year 535.

APHUA Cobites, in ichthylogy, the name of a small fish common in the Mediterranean. It never exceeds three or four inches in length, its body is round, and flatted a little on the back: its color is white variegated with black spots. Also a species of cyprinus that inhabits in shoals the shores of the northern European seas.

APHYLLANTHES, leafless flower, or blue Montpelier pink; a genus of the monogynia order, and hexandria class of plants; natural order, fifth, tetrapetaloidæ. In character it differs not from the Juncus or rush, but in having a calyx of six petals, whereas the juncus has no calyx. There is only one species; viz. Montpeliensis, a native of France. The root consists of a number of slender, hard, woody, long, and contorted fibres: the radical leaves are very numerous, two inches long, extremely narrow, and wither very quickly. The stalk is round, smooth, without a joint or knot, naked, and tolerably firm; at its top stands a single and very beautiful blue flower, arising from a compound imbricated cup.

APHYLLION, in botany, the broom rape.

APHYTEIA; from *α*, and *φυτος*; a plant, having neither root, stem, nor leaves. Class, monadelphia; order, triandria. Its generic characters are: CAL. perianth monophyllous, funnel-shaped: COR. rudiments of three petals, growing to the divisions of the calyx: STAM. filaments, short: ANTHERÆ, convex: PIST. inferior germ: STYLE, thick and short: STIGMA, triangular: PER. a berry, one-celled: SEEDS, numerous. There is one species, viz. A. hydnora, a vegetable without leaves, stem, or root; parasitical, consisting of a single fructification, which is four inches over, succulent. The ripe fruit, which is not unpleasant to the smell, is eaten, both raw and roasted, by the Hottentots. First discovered by Thunberg at the cape of Good Hope.

APIAN, or Appian, Peter, surnamed Bienewitz, an astronomer and mathematician, born at Leisnick in 1495, and died in 1552. He wrote, among other things, 1. Astronomicum Cæsareum, fol. Ingolst. 1540. 2. Cosmographia, 4to. 1529, 1575, &c. He was the first who discovered that the tails of comets are always projected in a direction from the sun, and records his observations upon five which appeared in the years 1531, 1532, 1533, 1538, and 1539. He was treated with great respect by the emperor Charles V who both enriched and ennobled him.

APIARIA, in natural history, a species of fly found only in autumn, and frequently met with on parsley; it is two-winged, of a deep and shining black, and gathers wax on its legs in the manner of the bee. It is a species of the attelabus. This is the clerus, with red wings, and three bluish bands of Fabricius; the clerus nigro-violaceus hirsutus, &c. of Geoff. Clerus; ceruleo-violaceus of Degeer; and dermestes apiarius of Schranck. Also a species of musca, the syrphus apiarius of Fabricius, a native of Italy.

APIARY; Latin apis, a bee; a place where bees are kept. The objects to be attained in the construction and management of an apiary are connected with the whole economy of the bee-hive; and will meet our attention at length in the article Apis. But a general summary of them and of the best apiaries that have as yet been constructed may be useful here. It will be clear then that to secure the prosperity and multiplication of the bees, to increase the amount of their productive labor, and to obtain their products in the readiest manner, and with the least possible detriment to the stock, are the powerful points of consideration. The apiary should afford to the bees the best shelter against moisture and the extremes of heat and of cold, and especially against sudden vicissitudes of temperature: it should protect them against their enemies; afford them every facility of constructing their combs, and rearing their young; allow of every part of the combs being inspected, and being capable of removal when requisite; and, while due attention is paid to economy, it should be made of materials that will ensure its durability.

Some cultivators of bees have been chiefly anxious to promote their multiplication, and to prevent the escape of the swarms in the natural way, by procuring what they have termed artificial swarms,—which they effected by separating a populous hive, previous to its swarming, into two parts, and allowing to each greater room for the extension of their works; others have contemplated only the abundance of the products which they yielded, and the facility of extracting them from the hive, without showing any particular solicitude as to the preservation of the bees themselves. Another class of apiarians have had it more particularly in view to facilitate the prosecution of researches in the natural history and economy of bees. Mr. Huber's hive is peculiarly calculated for the last of these objects, and its construction is founded on an accurate knowledge of the habits of these insects. He has given it the name of Ruche en livre ou en feuillets, from its opening and shutting somewhat in the manner of the leaves of a book. This book or leaf-hive is composed of from eight to twelve square wooden frames, placed vertically, and joined together sideways like the hoops of a cask. Each frame consists of two uprights, one inch in thickness, a foot in height, and an inch and a third in width, connected by an upper and lower cross bar, ten inches long, and of the same breadth and thickness as the former; so that all the frames may be joined together, without leaving any interval. The two external frames are closed each by a

pane of glass, which is covered by a shutter on the outside: and the whole is properly secured in its place, and further protected by an external cover. An aperture must of course be left in the lower part of one of the frames to serve as a door. In order to determine the bees to construct their combs in the plane of each leaf, a small piece of honey-comb is fixed, by means of pegs, to the top of each in the proper position; as it is well known the bees always complete their work in the direction in which they find it begun, unless they meet with some insurmountable obstacle. A proper distance is thus preserved between the lateral surfaces of the perpendicular combs; and the external ones, being only three or four lines distant from the glass panes, may be easily inspected by opening the shutters; and also, by opening in succession the different divisions of the hive, both surfaces of every comb may at pleasure be fully brought into view. No difficulty is experienced in introducing swarms into hives of this construction; and after the lapse of a few days, when the colony is fully established, the bees will very patiently submit to be daily inspected. This hive, therefore, allows us to judge by inspection, whether the population is sufficient to admit of division,—if the brood is of the proper age,—and if males exist, or are ready to be produced, for impregnating the young queen; all which circumstances are of material consequence to the success of the operation. It is essential that some of the larvæ should not have been hatched above three days before this attempt is made. The frames must then be gently separated at the middle of the hive, and two empty frames be introduced in the interval between the former; each of these new frames having a partition which closes them completely, so as to enable the two portions to be entirely separated without leaving any opening. The door of that portion, in which the queen happens to be at this time, may remain open; but the one belonging to the other part must be closed, so as to retain the bees that have no queen, prisoners for four-and-twenty hours, allowing still, however, sufficient circulation of air. After this interval they appear to have forgotten their queen; at least they are no longer anxious to seek for her, but bestow all their solicitude in the education of the larvæ, so as to convert a certain number of them into queens to supply the loss they have sustained. This they accomplish in ten days or a fortnight after the operation. The two colonies are now perfectly distinct, and are never found afterwards to intermix. Further advantage attending a hive of this construction consists in its enabling us to force the bees to produce a much greater quantity of wax than they would naturally do. The interval which separates the combs, when the bees have not been disturbed in their operations, is constantly the same, namely, about four times. Were they too distant, it is evident that the bees would be much dispersed, and unable to communicate their heat reciprocally, and the brood would not be preserved in a sufficient degree of warmth. Were the combs too close, on the contrary, the bees could not freely traverse the intervals, and the work of the hive would suffer. It is evident that we may avail ourselves of this instinct, and, by separating farther asunder the combs that are already built, induce the bees either to extend the breadth of those they had begun, or to build others in the interval, if sufficient space be allowed them for this purpose. Thus, by interposing three empty frames, one between every alternate interval of the combs in a hive containing six combs, three additional combs, if the proper season be chosen, will be obtained at the end of a week; and if the weather continue favorable, the operation may be repeated, and the same number of additional combs procured the week after.

The obstacles to the general employment of Mr. Huber's hives are the expense of constructing them, and the greater degree of attention which they require. It has also been objected that the flatness of the roof was prejudicial, by allowing the moisture which exhales from the bees to collect at the top, and to fall in drops at different parts, to the great injury of the subjacent contents of the hive. Féburier proposes therefore the employment of frames in the form of a trapezium, so that the roof shall be considerably inclined to the horizon. He borrows this shape from Bosc, whose hive consists, however, only of two boxes joined together sideways, and separable in order to form artificial swarms. This was an improvement upon Gelieu's hive, which was formed of two square boxes united laterally. Delator had recommended a still more simple form than that of Bosc, though less convenient, namely, that of a triangle resting on its base. Mr. Ravenel's hive consists of three square boxes instead of two; Mr. Scrain's is also made up of three boxes; but they are low and of great length, and are joined endways: a communication being established between them by apertures made in the divisions which separate the boxes. But it is now well established that partitions of any kind are detrimental to the prosperity of bees. The same objection applies, though perhaps in an inferior degree, to storied hives. A great variety of the latter description, however, have been recommended by different cultivators. In France they are known by the name of ruches en hausses. Mr. Thorley's improved hive, of which there is an account in the article Apis, is of this class: and Mr. Lombard's ruche villageoise may also be referred to the same head, although it be of much simpler construction than any other compound hive. Mr. Lombard's hive is composed of two parts, a body and a cover, forming together an elevation of from seventeen to twenty inches on a uniform diameter of one foot, excepting the upper part which ought to be convex. The body is formed of bands of straw, similar to that of the cottages in this country. At the top and bottom of the body is placed an exterior band which forms a projecting border on each end, the lower one giving the hive a firm station on its pedestal, the upper one contributing to secure the attachment of the cover, or allowing of another similar body being placed above the first, if such an addition should be deemed necessary. At the top of the body, and even with the upper band

is placed a flooring-board, made of a light plank ten inches in breadth in all directions; and the four corners of which are sawed off in such a manner that the breadth along the diagonal measures one foot. This board is fixed by nails inserted in the upper double band and entering a little into the front. The four openings that are left on the sides are necessary for the passage of the bees and for the escape of the vapors which are exhaled from them in winter. A flat rod traverses the hive immediately under the board; and projecting from the two sides about an inch and a half affords handles for lifting the hive, and facilitates the fastening of the cover which has also a projecting rod corresponding with that of the hive. At the bottom is an opening, two inches broad and nine lines in height, for the ingress and egress of the bees. The cover is formed in the shape of a dome, with a vertical handle at the top and a cross-bar at the lower part, by the projecting ends of which it may be tied to the ends of the bar in the body; and which serves also as a support to the combs that are constructed in the cover. For the latter purpose also two other bars are placed crossways one above the other. All the hives, and all the bases of the covers, are to be made of one uniform diameter, in order that the hives may, if occasion require it, be placed upon each other, and the covers be adapted to any of the hives that may happen to be at the top.

Ducouédie's pyramidal hive differs but little from that of Mr. Thorley. A common straw hive is taken, containing a swarm, which is allowed to remain till the spring of the following year; it is then placed on the top of a square box, with which it is made to communicate by a round aperture at the top of the box. In this state it is termed by the French la ruche Ecossaise, or, ruche de M. de la Bourdonnaye. On the following spring a second box is placed under the first, and the whole now assumes the name of la ruche pyramidale. The bees are still allowed no other ingress or egress but by a single hole made in the lowest story. The upper stories may then be removed in succession, while further room is allowed below by the addition of fresh boxes. It it stated, by M. Ducouédie, that the bees in his pyramidal hive never perish by hunger or by cold, for they always abound in provisions, and are too numerous to be affected by the most rigorous winter. When the bees are in groupes they maintain the necessary warmth in the hive; and the brood on the return of spring is hatched one month sooner than in any other hive. Mr. Huish, the latest and best writer perhaps on this subject, has, however, made it clearly appear that these advantages are much exaggerated, while its inconveniences are passed over in silence. It is difficult, if not impossible, to proportion the hives in all cases to the magnitude of the swarms, or to the energy with which they labor. The honey being taken from the oldest cells is deteriorated by an admixture of pollen, communicating to it a degree of bitterness of which it is difficult to deprive it; and is less abundant in consequence of the diminished capacity of the cells in which the cocoons of successive bees, in their state of nympha, have accumulated. From their being divided into different stories the bees are obliged to live as it were in different families; while their own preservation, and that of the brood, requires them to live in the strictest union. The heat is also lessened by the division of the bees into different groupes. The upper part of these hives being all necessarily flat (except the first or straw-hive), occasions a serious inconvenience by allowing moisture to collect and drop down into the middle of the hive instead of trickling down the sides. The injury which this does to the combs and to the bees themselves who are constantly exposed to its influence is, according to Mr. Huish, the most common cause of the loss of the hives during the winter. The bees, he observes, always begin their work in the most elevated point of the hive, and seek for that purpose the central part of the roof. If the top be flat, and especially if it be as spacious as in the hives called pyramidal, the bees will not find this centre; they will work one year in one part, and the following year in another. This is, without doubt, one of the causes which oblige a proprietor to wait three or four years before any honey can be gathered from these hives.

Mr. Huish's hive is very similar in form to that used in Greece: it is a straw basket in the shape of a flower-pot, that is, of a broader diameter above than below. Eight pieces of well-seasoned wood, about eight inches broad and half an inch thick, are laid parallel to one another at equal distances over the top of the basket, and fastened to an outer projecting band: they are then covered with net-work, over which is placed a circular board, or, what is better, a convex cover of straw extending over the whole of the top of the hive. This net-work obliges the bees to fasten their combs to the transverse boards, by means of which each comb can easily be lifted up without interfering with any other part of the hive, or occasioning the loss of a single bee; and the whole of the interior of the hive is thus open to inspection, and we are enabled to trace the devastations of the moth, or to ascertain the presence of any other enemy.

APIASTELLUM, in botany, the name of two different species of plants with different authors; Dodonæus expressing by it the common baum, and Apuleius the black bryony.

APIASTER, in ornithology, the bee-eater, a species of the merops. This is merops galilæus of Hasselquist, ispida cauda molli of Kramer, guêpier of Buffon, schaeghaghi of Forskal, and common bee-eater of English writers.

APIASTRUM, in botany, a name given by the ancients to two different plants. The one of these plants was the poisonous water crowfoot; the other the common garden baum, so called by these writers from their having observed that the bees were very fond of it.

APICES, the same with antheræ. See ANTHERA.

APICIUS, a Roman surname, famous, or rather infamous, for producing three remarkable gluttons. The second is the most celebrated of the three. He lived under Tiberius, spent immense sums on his belly, and invented divers

sorts of cakes which bore his name. He kept, as it were, a school of gluttony at Rome. After having spent two millions and a half in entertainments, finding himself very much in debt, he examined into the state of his affairs; and seeing that he had but 250,000 livres remaining, he poisoned himself, out of apprehension of starving with such a sum! He had prostituted himself when very young to Sejanus.

APICULUM, in antiquity, a kind of thread, or fillet, which the flamens wore in lieu of the apex.

APIE'CES, } In pieces; in separate parts.
APIECE'. } On piece, in a separate part or share.

Men, in whose mouths at first sounded nothing but mortification, were come to think that they might lawfully have six or seven wives *apiece*. *Hooker.*

The people of Egina, and the Athenians, had but small ones, and the most of them consisted but of fifty oars *apiece*. *Hobbe's Thucidydes.*

I have to-night despatched sixteen businesses, a month's length *apiece*, by an abstract of success. *Shakspeare.*

One copy of this paper may serve a dozen of you, which will be less than a farthing *apiece*. *Swift.*

They (Sir John Elliot, Hollis, and Valentine) were condemned to be imprisoned during the king's pleasure, to find sureties for their good behaviour, to be fined, the two former a thousand pounds *apiece*, the latter five hundred. *Hume's History of England.*

APIFORMIS, in entomology, a species of musca, found in Germany. Also a species of sphinx, in the Linnæan system, and sesia in that of Fabricius. This is sphinx scopigera of Scopoli; sphinx crabroniformis, Wien. Schmetterl; and sphinx apiformis, hornet sphinx, Donov. Brit. Ins.

APIOCHAMA, a large rapid river of Peru, which, after running to the north of the city of La Paz, enters the west side of the river Beni.

APIOLÆ, in ancient geography, a city of Italy, which was taken by Tarquin the Proud, and with the stones thereof, according to Pliny, he founded the Roman capitol.

APION, a celebrated grammarian and critic, born in Egypt in the reign of Tiberius. He had all the arrogance of a mere pedant, and amused himself with inquiries difficult in their investigation, and insignificant in their consequences. In order to trace the family and country of Homer, he had recourse even to magic, and asserted that he had successfully invoked the appearance of shades to satisfy his curiosity, whose answers he was not allowed to make public. He valued himself on having discovered that the two first letters of the Iliad, considered numerically, amounted to forty-eight, and he fancied that the poet had used these letters designedly to express the number of books. Hence he concludes, that the opening of the poem was last written. The most celebrated of his works is one entitled the Antiquity of the Jews, to which people he opposed himself with the hereditary resentment of an Egyptian. The reply of Josephus, against Apion, has survived the attack. He was accustomed to boast that those to whom he dedicated his works were thereby rendered immortal; the vanity and falsehood of which time has remarkably proved, as no one of his works are now known but through the medium of some other author.

APIOS, in botany, a name given by many authors to those species of the tithymal, or spurge, which have tuberose roots, the juice of which is purgative. Apios is also the name given by Boerhaave to some of the leguminous plants comprised by Linnæus under the name Glycine.

A P I S.

APIS, in astronomy, the bee, a southern constellation, called also musca.

APIS, in mythology, a divinity worshipped by the ancient Egyptians at Memphis, under the form of a living ox, having certain exterior marks; in which animal the soul of the great Osiris was supposed to subsist! This animal had the preference to all others, as being the symbol of agriculture, for the improvement of which that prince had done so much. According to several learned writers on the Egyptian religion Apis was only a symbolical deity. 'Amongst the animals consecrated to ancient rites,' says Ammianus Marcellinus, 'Mnovis and Apis are the most celebrated; the first is an emblem of the sun, the second of the moon.' Porphyry informs us, that Apis bore the characteristic signs of both; which opinion Macrobius confirms. According to the Egyptians this bull owes his birth to celestial fire. Pliny has thus described the characters which distinguish this sacred bull: 'A white spot, resembling a crescent, on the right side, and a knot under the tongue, were the distinguishing marks of Apis.' When a cow, therefore, which was thought to be struck with the rays of the moon produced a calf, the sacred guides went to examine it, and if they found it conformable to the description, they announced to the people the birth of Apis. Ælian informs us, that as soon as a calf of the above description was produced 'the Egyptians immediately built a temple to the new god, facing the rising sun, according to the precepts of Mercury, where they nourished him with milk for four months. This term expired, the priests repaired in pomp to his habitation, and saluted him by the name of Apis. They then placed him in a vessel magnificently decorated, covered with rich tapestry, and resplendent with gold, and conducted him to Memphis, singing hymns, and burning perfumes. There they kept him for forty days. During this space of time women alone had permission to see him.' After the inauguration of the god, this city, he was conveyed to Memphis with the same retinue. There they completed the ceremonies of his inauguration, and he became sacr

to all the world. Apis was superbly lodged, and the place where he lay was called the bed. Strabo having visited his palace thus describes it: 'The edifice where Apis is kept is situated near the temple of Vulcan. He is fed in a sacred apartment, before which is a large court. The house in which they keep the cow that produced him, occupies one of its sides. Sometimes, to satisfy the curiosity of strangers, they make him go out into this court. It was said that he predicted future events, by various signs. 'Apis,' says Pliny, 'has two temples, called beds, which serve as an augury for the people. When they come to consult him, if he enters into a particular one it is a favorable presage, and fatal if he passes into the other. He gives answers to individuals, by taking food from their hands. He refused that offered him by Germanicus, who died soon after.' The anniversary of his birth was always celebrated for seven days; at which time the people assembled to offer sacrifices of oxen. The bull, Apis, however much honored in his life, was not permitted to live above a certain time, fixed by the sacred books. According to Pliny, when he has attained that period, they drown him in the fountain of the priests. When this event happened he was embalmed, and privately let down into the subterraneous places destined for that purpose. In this circumstance, the priests announced that Apis had disappeared; but when he died a natural death, they proclaimed his death, and solemnly conveyed his body to the temple of Serapis, which strangers were forbidden to approach, and where the priests themselves only entered when Apis was interred. 'It was then,' says Plutarch, 'that they opened the gates called Lethes and Cocytus (of oblivion and lamentation), which made a harsh and piercing sound.' According to Plutarch, the term prescribed for the life of Apis was twenty-five years; which number marked a period of the sun, and of the moon, and the bull was consecrated to these two bodies. Syncellus, in his Chronography, when he comes down to the thirty-second Pharaoh, called Aseth, says, 'Before Aseth, the solar year consisted of 360 days. This prince added five to complete its course. In his reign a calf was placed among the gods, and named Apis.' From these facts, M. Savary infers, that Apis was the tutelary divinity of the new form given to the solar year, and of the cycle of twenty-five years discovered at the same time. This deity had a marked relation to the swelling of the Nile, as is testified by a great number of historians. The new moon which followed the summer solstice, was the era of this phenomenon, on which the eyes of every body were fixed. And Pliny speaks as follows on this subject: 'Apis had on his right side a white mark, representing the crescent; 'this mark,' continues Ælian, 'indicated the commencement of the inundation.' If Apis possessed the characteristic signs which proved his divine origin, he promised fertility and abundance of the fruits of the earth. It seems demonstrated, therefore, M. Savary adds, that this sacred bull, the guardian of the solar year of 365 days, was also regarded as the genius who presided over the overflowing of the river. The priests, by fixing the course of his life to twenty-five years, and by making the installation of a new Apis concur with the renewal of the period above mentioned, had probably perceived, as the result of long meteorological observation, that this revolution always brought about abundant seasons. Nothing was better calculated to procure a favorable reception of this emblematical deity from the people; since his birth was a presage to them of a happy inundation, and of all the treasures of teeming nature. That which was renewed every year towards the 12th or 13th of the month Payn, which corresponds with the 17th or 18th of June, was called the birth of Apis.

This deity is frequently represented on medals in the form of a bull, in company with Osiris, who is here represented adorned with the lotus, having a spear in his right hand, and a sistrum in the left.

Apis (the Bee), in zoology, a genus of insects belonging to the order of insecta hymenoptera. The mouth is furnished with two jaws, and a proboscis infolded in a double sheath; the wings are four in number, the two foremost covering those behind when at rest; in the anus or tail of the female and working bees there is a hidden sting. These insects are distinguished into several species, each of which has its peculiar genius, talent, manners, and disposition. Variety prevails in the order of their architecture, and in the nature of their materials. Some live in society, and share the toils; such are the common bee. Others dwell and work in solitude, building the cradles of their families; as the leaf-cutter bee does with the rose-tree leaf; the upholsterer with the gaudy tapestry of the corn-rose; the mason bee with a plaster; the wood-piercer with sawdust. All are employed in their little hermitage with the care of providing for their offspring. The species enumerated by Linnæus are no fewer than fifty-five; of which the following are the most remarkable: A. Brasilianorum, or pale red hairy bee, with the basis of the thighs black. This is a very large bee, everywhere covered with a testaceous skin. It is a native of America. A. cariosa is a yellowish hairy bee; and the feet and front are of a bright yellow color. It builds in the rotten trees of Europe. A. centuncularis, leaf-cutter, or black bee, having its belly covered with yellow down. The nests of this species are made of leaves, curiously plaited in the form of a mat or quilt. There are several varieties of the leaf-cutting bees, all equally industrious. They dig into the ground, and build their nests, of which some have the form and size of thimbles inserted one within another, others the size and shape of goose-quills. These nests are composed of pieces of leaves. Each sort of bees cuts into its own materials; some the rose-tree leaf, others the horse-chestnut. A careful observer may discover rose-tree leaves cut, as it were, with a pinking-iron; and there he may procure himself the pleasure of seeing with what dexterity a bee, destitute of any mathematical instrument, cuts out a circular piece. fit to be either the bottom

or the lid of one of those nests; others it cuts out into ovals and semi-ovals, which form the sides of the nests, into each of which it deposits one egg, with ready prepared victuals. A. dentata, or shining green bee, with black wings, and a kind of teeth on the hind thighs. The tongue of this bee is as long as its body. A. ferruginea, or smooth black bee, with the feelers, mouth, belly, and feet, of an iron color. This is a small bee, and supposed to be of an intermediate kind between the bee and wasp. It is a native of Europe. A. florisomnis, or black bee, with a cylindrical incurvated belly, having two tooth-like protuberances at the anus, and a kind of prickles on the hind legs. This bee sleeps in flowers; whence the name. A. lapidaria, or red hairy bee, with a yellow anus; builds in holes of rocks. A. mellifica, or domestic honey-bee. But the particulars concerning this valuable species are so numerous and interesting as to require a separate article for their detail; which the reader will therefore find at due length under the English name, BEE. A. muscorum, or yellow hairy bee, with a white belly, builds in mossy grounds. The skill displayed by these builders is admirable. In order to enjoy the pleasure of seeing their operations, let a nest be taken to pieces, and the moss conveyed to a distance. The bees will be seen to form themselves into a chain, from their nest to the place where the moss has been laid. The foremost lays hold of some with her teeth, clears it bit by bit with her feet (which circumstance has also procured them the name of carding bees); then, by the help of her feet, she drives the unravelled moss under her belly, the second in like manner pushes it on to the third. Thus there is formed an uninterrupted chain of moss which is wrought and interwoven with the greatest dexterity by those that abide by the nest; and that their nest may not be the sport of the winds, and may shelter them from rain, they throw an arch over it, which they compose with a kind of wax, tentaceous, though thin in substance, which is neither the unwrought bees-wax nor the real wax. Dissolved in oil of turpentine, it may be used in taking off impressions. A. rostrata is distinguished by the upper lip being inflected and of a conical shape, and by the belly being invested with bluish belts. They build their nests in high sandy grounds, and there is but one young in each nest. A. terrestris is black and hairy, with a white belt round the breast, and a white anus; it builds its nest very deep in the earth. A. variegata; the breast and belly are variegated with white and black spots; the legs are of an iron color. It is a native of Europe. This species sleeps in the geranium phæum, or spotted crane's bill. A. violacea is a red bee, and very hairy, with bluish wings. It is a native of Europe. The violacea is said to perforate trees, and hollow them out in a longitudinal direction, they begin to build their cells at the bottom of these holes, and deposit an egg in each cell, which is composed of the farina of plants and honey or a kind of gluten.

The Domestic bee differs in a variety of particulars from most other animals, and admits a threefold description; under its various characters of QUEEN BEE, DRONE BEE, and WORKING BEE; for though this last kind is, strictly speaking, the only honey bee, yet as all the three kinds are found, and seem to be necessary, in every community or hive of bees, they go under the same general name of APIS MELLIFICA, while at the same time, they differ so much from each other, (more indeed than some different species of the same genus of other animals,) that a particular and separate description of each is necessary. This we cannot give more accurately than in the language of Mr. Bonner, one of the latest writers on the subject. 'The DRONES,' says this gentleman, 'may easily be distinguished from the common or working bees. They are both larger and longer in the body. Their heads are round, their eyes full, and their tongues short. The form of the belly differs from those of both queen and common bees; and their color is darker than either. They have no sting, and they make a much greater noise when flying than either the queen or the common bees; a peculiarity of itself sufficient to distinguish them.' Other writers on this subject have asserted, that the dissection of the drone gives as great proof of its being the male, as that of the queen does of her being female. In this creature there is no appearance of ovaries or eggs, nor any thing of the structure of the common working bees, but the whole abdomen is filled with transparent vessels, winding about in various sinuosities, and containing a white or milky fluid. This is plainly analogous to that fluid in the males of other animals, which is destined to render the eggs of the female prolific; and the whole apparatus of vessels, which much resemble the turnings and windings of the seminal vessels in other animals, is plainly intended only for the preparation and retention of this matter, till the destined time of its being emitted. On squeezing the hinder parts, also, may be forced out the penis, a small and slender fleshy body contained between two horns of a somewhat harder substance, which join at their base, but gradually part asunder as they are continued in length. These parts, found in all the drones, and none of them in any other bees except these, seem to prove very evidently the difference of sex. If a hive is opened in the beginning of spring, not a single drone will be found in it; from the middle of May till the end of June hundreds of them will be found, commonly from 200 or 300 to 1000; but from August to the following spring it would be in vain to seek for them. They go not out till eleven in the morning, and return before six in the evening. But their expeditions are not those of industry. Their rostrum and feet are not adapted for collecting wax and honey, nor indeed are they obliged to labor. They only hover upon flowers to extract the sweets, and all their business is pleasure. Their office is, to impregnate the eggs of the queen after they are deposited in the cells. And while their presence is thus necessary, they are suffered to enjoy the sweets of love and life; but as soon as they become useless in the hive, the working bees declare a war of extermination against them, and make terrible slaughter of them. This war affects not only the drones already in life, but even the eggs and maggots in the drone cells; for after the season proper for

creasing the number of bees is past, every vestige of the drones is destroyed, to make room for honey. Besides these large drones, Maraldi and Reaumur long ago asserted that there were others of a lesser size, not exceeding that of the common working bees. The fact, however, was not supposed to be ascertained before the experiments of Mr. Debraw seemed to put it beyond a doubt. It is well known that the large drones never appear in the hive before the middle of April; that they are all dead before the end of August, when the principal breeding season terminates; and that they are destroyed, together with all their worms or nymphs, by the working bees to save honey: yet it is equally certain that the bees begin to breed early in the spring, sometimes in February if the weather is mild; and that many broods are completed before these drones appear. But if drones of a smaller size are suffered to remain, which in a time of scarcity consume less honey than the others, these will answer the purpose of supplying the early broods, and the larger drones are produced against a time of greater plenty. Some observers affirm, that the smaller drones are all dead before the end of May, when the larger species appear and supersede their use. These circumstances accord with the suggestion of Abbé Le Pluche in his Spectacle de la Nature,—that a small number of drones are reserved to supply the necessaries of the ensuing year; and that these drones are very little, if at all, larger than the common bees. Mr. Bonnet, however, not only doubts the long-established doctrine of the fecundating powers of the drones in general, but denies the existence of Mr. Debraw's little drones altogether. He urges the following argument on both subjects: 'Although almost all agree that they are the males, and couple with the queen, yet they acknowledge that they never saw an instance of any one of them in the act with her. It is surely wonderful if the drones are the males that they should have escaped the prying eyes of philosophers in all ages; whereas, almost every eye has detected smaller insects in the act. Swammerdam, sensible of this, to shelter himself flies to that false refuge that the smell of the drones answers the same end as copulation. Others say, that their heat is necessary for hatching the young bees. But this argument has no weight with me; as bee-hives have most part of their bees bred, and are well-nigh swarming, before any number of drones appear in the hive. Besides, by the time that they become numerous, so as their heat might do good in that respect, the heat is generally so great that the bees have too much of it, and therefore often fly out in the fore part of their hive to get air. It is therefore plain that they need not be at the expense of maintaining a parcel of idle gluttons for the sake of increasing what would do them more harm than good. That the queen stands in no need of their assistance, to fecundate or impregnate her, appears plain from this consideration, that she lays eggs, which produce young bees, without having had any previous communication with the drones. I will not, however, suppose that the drones are of no use in the hives; but that the queen lays eggs which produce young bees, without so much as seeing a drone, I can with the utmost confidence affirm. The advocates for the old doctrine, that the drones are males, allege that they impregnate the queen before their brethren kill them. According to this theory, she should continue for no less a period than seven or eight months, with about 12,000 impregnated eggs in her ovarium, which would certainly make her appear very large during the whole of that period. But it is unnecessary to waste arguments in refutation of this doctrine, as I have repeatedly had queens breed and lay eggs, and those eggs become bees, although these queens were bred seven months after all the drones were dead, and some weeks before any new ones were hatched. See BEE, QUEEN. These experiments, I think, are sufficient to silence all the arguments advanced by the advocates for the drone system. Mr. Debraw, indeed, creates little drones, and gives them power to live all the year, and to impregnate the queen at pleasure. But as room does not permit me to narrate the experiments whereby he attempts to prove this, I shall content myself with stating his sentiments in as few words as possible. He asserts, that, besides the common large drones, which every person acquainted with bees knows at first sight, there is a small kind of drones, which are, to all appearance, like the common bees, there being no visible difference, except that they have no sting, which he discovers by immersion in water, and pressure. After relating an experiment on this head, he says, 'I once more immersed all the bees (of a small swarm) in water; and, when they appeared in a senseless state, I gently pressed every one of them between my fingers, in order to distinguish those armed with stings from those that had none, which last I might suspect were males. Of these I found fifty-seven, exactly of the size of common bees, yielding a little whitish liquor on being pressed between the fingers.' He farther alleges, that if there be only a queen and bees that have stings in the hive, although the queen lays eggs, yet if she has no drones to inject the seminal matter upon them, the eggs will still remain unproductive, and will decay, even although there were 1000 bees with stings in the hive. In answer to this, I shall here narrate an experiment I made several years ago. On the first of September, 1788, I took all the bees out of a hive that was breeding very fast, and in which I found only four drones, which I killed. I put the bees into a hive that had nothing in it but empty combs. After waiting ten days, upon looking between the combs, I found maggots newly sealed up in these cells. I then took out all the bees, and shook them into a tub full of water, from which immersion I recovered them gradually, and while doing this, I pressed each bee individually, to try if I could discover any of these stingless little drones; but not one appeared, all of them having stings, to the number of 3000. After this I searched the old hive I had taken them out of, and cut out all the combs that had eggs or young in them; among which I found some cells that had new eggs in them; others whose eggs were converted into a small worm, and

other some with maggots in them. I then restored the queen and all the bees, putting them into the same hive again, but without leaving a single egg in it. During the succeeding twenty days I inspected the hive, and found the bees, in fine weather, working with great alacrity, a sure sign that the queen was breeding again. After this, on turning up the hive, and cutting out one of the brood combs, I found new-laid eggs in some of them; others containing maggots, besides some young bees almost ready to emerge from their cells. I made another experiment about the same time upon a hive that had some brood combs, but had not had a large drone for several weeks preceding. This hive did not contain above 500 bees, a circumstance that was in my favor, as, being less numerous, the trouble was proportionably less. I carried the hive into a close room in my house that not a single bee might escape me; but after repeating the former experiment of immersing them in water, recovering and pressing them one by one, I found that every one of them had a sting. I think these experiments may satisfy any unprejudiced person, that there is no such creature in existence as a small drone bee; unless it be in Mr. Debraw's brain. But if Mr. Debraw, who says he can find fifty-seven in a small swarm of bees, will send me the odd seven, I will give him one of my best hives for them, and I think he will not say that they are ill sold.'

'The QUEEN, continues Mr. Bonner, is easily distinguished from all the other bees in the hive, by the form, size, and color of her body. She is considerably longer, and her wings are much shorter in proportion to her body, than those of the other bees. The wings of both common bees and drones cover their whole bodies, whereas those of the queen scarcely reach beyond the middle, ending about the third ring of her belly. Her hinder part is far more tapering than those of the other bees: her belly or legs are yellower, and her upper parts of a much darker color than theirs. She is also furnished with a sting, though some authors assert that she has none, having been induced to form this opinion because she is extremely pacific; so much so indeed, that one may handle her, and even teaze her as much as he pleases, without provoking her resentment. For my part, I never can excite a queen bee to draw her sting, nor could I even get a sight of it, but when I pressed her body. The omniscient governor of nature has wisely ordained this majestic insect to be of a pacific disposition; for, were she otherwise, were she like the other bees of so irritable a temper as to draw her sting on every occasion, and to leave it in the body of her antagonist, it would prove of dangerous and often fatal consequence to the whole hive; for every bee, after losing her sting, dies within a day or two at the utmost. The queen bee is solemn and calm in her deportment. A young queen is a great deal smaller in size than a full grown one; being not much longer than a common bee, and is therefore not so easily observed when sought for. When only three or four days old, she is very quick in her motions, and runs very fast; but when pregnant with eggs, she becomes very large, and her body is heavy. When travelling, she drags along in a very slow manner, and is not very expeditious in flying. That this majestic animal is a female, the very designation she bears, of queen, seems to imply that modern authors are convinced, though many of the ancients were of a different opinion. But as it is also now unanimously admitted, that she lays every egg in the hive, she ought rather to be called the mother bee. For, indeed, from the best observation that ever I could make, she possesses and exerts no sovereignty over the other bees. She evidences the greatest anxiety for the good of the commonwealth with which she is connected; and, indeed, every member of it shows an equal regard for her welfare. But I never could observe, that she issues any positive orders, to be punctually obeyed by the other bees. The truth seems to be, that she and the other bees are all equally acquainted with their duty by instinct, and have an equal pleasure in performing it, without waiting for orders from each other. That there is, nevertheless, the greatest order and regularity among them, is certain; for they lay their plans and execute them, in the best possible manner, by the influence of the above powerful substitute for reason. Almost all writers are of opinion, that the queen lays three different kinds of eggs, viz. one kind for the production of a queen bee; another species for that of the working bee, and a third for producing the drones. It was also long a received opinion, that no queen could lay eggs, that were capable of producing bees, without the assistance of drones. Schirach refutes this doctrine, and entirely denies such a use of the drones. He advances this opinion, that 'the queen lays eggs, which produce young bees, without any communication with the drones; and affirms that all the working bees are females in disguise; every one of whom, in an early stage of her existence, was capable of becoming a queen; from a knowledge of which fact, swarms may artificially be obtained, from the early months of spring, and in any succeeding month even to November.' His experiments have been very numerous, and obviate every doubt and objection. He performed the operation, upon one and the same stock, for at least fifty or sixty times, from mere fragments of the combs, &c. This novel and wonderful doctrine excited no small contention, and not a few counter experiments among naturalists on the continent, without being decided even by the great Bonner. He asserts, which is indeed the grand and decisive proof, that 'the practice of this art, of raising artificial queens, has already extended itself through Upper Lusatia, the Palatinate, Bohemia, Bavaria, Silesia, and several parts of Germany, and even of Poland.' That a queen can be raised from an egg in a common cell; or, in other words, that the same egg is capable of being reared up to be either a queen or a common bee, as the bees please, appears to me, from my own experiments, to be past a doubt; and that a queen who never saw a drone can lay eggs, which will produce bees, is equally certain. Both these facts, will, I flatter myself, appear to the curious and learned reader to be clearly ascertained by the following experiments: Long before I heard of Mr. Schi-

rach's theory, or experiments, I had often taken off swarms without leaving any queens or royal cells in the mother hive; notwithstanding which they bred young queens, which surprised me greatly how they had obtained them, as the received opinion then was, that they could not breed a queen bee if the old queen was taken away before a royal cell was erected. But after seeing Schirach's sentiments on this subject, I thought his theory extremely probable, according to what I had observed among my own bees; and, resolving to ascertain the truth of it, I made many experiments of my own, which all succeeded to my wishes. But, in order to put the matter beyond all doubt, I shall relate an experiment I made with a hive in spring 1780, two months before the usual time of swarming, and which clearly ascertains both the facts at once. The hive was beginning to carry well, and to breed fast, but it was not half full of bees. It had only one queen, but neither drone nor royal cell; neither of which could be expected at that season of the year, as it was about the middle of April. I took out the queen, and most part of the bees, and left the hive with only some common bees, to hatch out the young brood in the cells, and provide themselves with a queen, but without leaving one single drone. They did not disappoint me; for as soon as the melancholy intelligence pervaded the hive, that their loving mother was torn from them, they made a mourning kind of noise for their great loss for about two hours: after which they all fell busily to work, and exerted themselves amazingly for two days; some being employed in forming the royal cell, and others injecting into it a large quantity of thick whitish liquid stuff, pretty much resembling cream. At the end of the third day the royal cell was completely formed; and, in the mean time, the common cells were sealed up by the other bees, who all continued busily employed. On the fifth day the royal cell was considerably enlarged, and I observed as much of the aforesaid white stuff in it as would have almost half filled a thimble, with a white maggot lying on the top of it. On the seventh day the bees sealed it up, and, on the seventeenth day, the young queen came forth out of her little palace, in all her pomp and majesty. On the twenty-fourth day the young queen became a mother, and laid eggs; on the thirty-first day these eggs were sealed, and on the forty-third day a number of young bees emerged from the cells. About the same time I repeated this experiment with other two hives, which both succeeded equally well. I made another experiment with a different hive, out of which I took the queen and most part of the bees. This hive had neither a royal cell nor drones in it, yet, in seventeen days after, a queen was reared, and on the twenty-fifth day she laid eggs. I then took out the young queen again, leaving some new-laid eggs in the old hive. Within eight days after there was another royal cell erected and sealed up. This I immediately took out of the hive; but, upon inspecting the hive eight days after, I found neither queen, eggs, nor royal cell, none of which indeed I expected. Upon taking a piece of comb, however, with eggs in it, out of another hive, and putting it into this hive, the bees erected another royal cell, which in due time produced another young queen. The advocates for the doctrine of the drones being males, and their aid being necessary for the propagation of bees, may perhaps plead, that although there were no drones in the hive, when I took the queen from it, yet there might have been eggs laid in drone cells, which would come forward to be drones as soon as the young queen, and so impregnate her, and render her fit for breeding. But the contrary is the fact: for, when the old queen was taken out of the hive, there was not a single egg in any of the drone cells. If there had, I should have seen the bees sitting upon the cells of the drone combs, as they did on those of the common bees, and on the royal cell. Besides, I turned up the hive every second day, during the whole period of forty-three days, in order to determine how long the bees took to erect the royal cell, and seal it up; how many days elapsed before an egg produced a queen; how old the queen was before she began to lay eggs; how many days passed before these eggs produced common bees; and, above all, whether the queen needed the agency of the drones to enable her to become a mother. To arrive at a certainty on this point, I often turned the bees over in the hive with a small stick, in search of young drones in drone cells, but could never discover the smallest vestige of them. But the young queen, on the tenth day of her age, began to lay eggs in drone cells, which produced young drones in the hive about sixteen days after. As I have repeated this last experiment again, and again, I can now affirm, with the utmost confidence and certainty, that the common, or working bees, are endued with the powerful faculty of raising a queen bee from an egg in a common cell, when their community stands in need of one. Their method is this: they make choice of a common cell with an egg in it, and inject some white liquid matter, from their proboscis, of a thickish substance.—They then begin to build upon the edges of the cell, and enlarge it. On the third day it appears fairly on the outside of the comb, in the form of a royal cell, and may now be properly so denominated. On the fifth day, the cell being now greatly enlarged, and a great deal of the whitish matter thrown into it, the royal maggot appears in the form of a semicircle, not unlike a new moon, being biggest in the middle part, and small at each end. In this form it is to be seen for two days, swimming on the top, and in the midst of the said matter in the cell; and on the seventh day it is sealed up. During this period, our princess undergoes various metamorphoses. I have opened the royal cell on the tenth day, and have found the maggot still on the top of the white liquor; and having taken it into my hand to show it to any friend, it would have moved for a short time, although at this period it had not the smallest resemblance to a bee, being still only a maggot. but on the fourteenth or fifteenth day the metamorphosis is so complete, that, instead of a gross white worm, forth comes a charming young queen bee, arrayed in all her glory. From the whole of these experiments, therefore, which I have repeated on various occasions, I can positively affirm, that

the queen bee is capable of becoming a mother, without so much as seeing a drone; and that the doctrines of almost all former writers on this subject, (Schirah, and one or two more excepted,) who affirmed that the queen cannot breed without the agency of the drones, or males, as they call them, is founded on a mistake. For a small piece of comb, with common eggs in it, may be taken and put into a box along with 400 common bees, and transported 1000 miles from a drone; and yet the bees will rear a queen from one of those eggs, and that young queen will lay eggs, which in due time will produce queens, commons, and drones. But whether every egg in the common cells of the hive can be nourished up to produce a queen I dare not positively say, although I am much inclined to think so: as I can safely affirm, that not above one in a dozen of my experiments, in rearing queens from what are called common eggs, i. e. eggs that commonly produce working bees, has ever yet failed, when I either made the trial by way of experiment, or adopted the plan as a matter of economy. Sometimes a single egg has failed in making the experiment; but this might have happened from some other accidental cause. As a proof of this, I offer to rear twenty queens, if not thirty, out of one hive, during the course of one summer. For within these last six years I have caused the bees to rear from eggs taken from common cells, which the bees would otherwise have reared up for working bees, no fewer than 200 artificial queens; and which queens laid eggs, that came forward to be bees, in the same manner as other queens, which may for distinction's sake, be styled natural ones. When a queen dies by any accident, the bees of her hive immediately cease working, consume their own honey, fly above their own and other hives at unusual hours when other bees are at rest, and pine away if not soon supplied with another sovereign. Her loss is proclaimed by a clear and uninterrupted humming. This sign should be a warning to the owner of the bees to take what honey remains in the hive, or to procure them another queen. In this last case, the stock instantly revives; pleasure and activity are apparent through the whole hive; the presence of the queen restores vigor and exertion, and her voice commands universal respect and obedience, of such importance is the queen to the existence and prosperity of the community. The dissection of the queen bee shows, evidently, that she lays many thousand eggs. It is computed that the ovaria of a queen bee contains more than 5000 eggs at one time; and therefore it is not difficult to conceive that a queen bee may produce 10,000 or 12,000 bees, or even more, in the space of two months.

The WORKING or COMMON BEE, is smaller than either the queen or the drone bee; and, as well as these, consists of three parts, viz. the head, which is attached by a narrow kind of neck to the rest of the body; the breast, or middle part; and the belly, which is nearly separated from the breast by an insection or division, and connected with it by another narrow neck or junction. There are two eyes in the head, of an oblong figure, black, transparent, and immoveable. The mouth and jaws, like those of some species of fish, open to the right and left, and serve instead of hands to carry out of the hive whatever encumbers or offends them. In the mouth there is a long proboscis, or trunk, with which the bees suck up the sweets from the flowers. They have four wings fastened to their middle part, by which they are not only enabled to fly with heavy loads, but also to make those well-known sounds and hummings to each other that are supposed to be their only form of speech. They have also six legs fastened to their middle. The two foremost of these are the shortest, and with these they unload themselves of their treasures. The two in the middle are somewhat longer: and the two last are longest. On the outside of the middle joint of these last, there is a small cavity in the form of a narrow spoon, in which the bees collect by degrees, those loads of wax they carry home to their hives This hollow groove is peculiar to the working bee. Neither the queen nor the drones have any resemblance of it. The tibiæ of the hind legs are ciliated, and transversely streaked on the inside. Each foot terminates in two hooks, with their points opposite to each other; in the middle of these hooks there is a little thin appendix, which, when unfolded, enables the insects to fasten themselves to glass, or the most polished bodies. This part they likewise employ for transmitting the small particles of crude wax which they find upon flowers, to the cavity in their thighs. The belly is ornamented with six rings; and contains, besides the intestines, the honey-bladder, the venom-bladder, and the sting. The honey-bladder is a reservoir, into which is deposited the honey that the bee sips from the cups of the flowers after it has passed through the proboscis, and through the narrow pipes that connect the head, breast, and belly of the bee. This bladder, when full, is of the size of a small pea; and is so transparent, that the color of the honey can be distinguished through it. The sting is situated at the extremity of the belly, and the head or root of it is placed contiguous to the small bladder that contains the venom. It is connected to the belly by certain small muscles, by means of which the bee can dart it out and draw it in with great force and quickness. In length it is about the sixth part of an inch. It is of a horny substance; is biggest at the root, and tapers gradually towards the point, which is extremely small and sharp; and, when examined by the microscope, appears to be polished exceedingly smooth. It is hollow within, like a tube, that the venomous liquor may pass through it when it strikes any animal, which it does the very instant that the sting pierces the skin, and insinuates itself into the wound; which proves mortal to many small animals, as well as to the bee herself, when she leaves her sting in the wound; as it draws after it the bladder, and sometimes part of the entrails of the bee. These working bees may be said to compose the whole community, except in the season of the drones, which hardly lasts three months. During all the other nine months there are no other bees in the hive except them and the queen. The whole labor of the hive is performed by them. They

build the combs, collect the honey, bring it home, and store it up in their waxen magazines. They rear up the eggs to produce young queens, common bees, and drones; they carry out all incumbrances that are in the hives; they defend the community against enemies of every kind, and kill all the drones.

In the Philosophical Transactions, No. clxxii. vol. 1., we have an account of a species of honey-bee found in some parts of America, very different in form and manners from the common bee of Europe. Their combs are composed of a series of small bottles or bladders of wax, of a dusky brown or blackish color; and each nearly of the size and shape of a Spanish olive. They hang together in clusters, almost like a bunch of grapes, and are so contrived that each of them has its aperture, while the bees are at work upon it: but as soon as it is filled with honey this aperture is closed, and the bees leave it and go to work upon another vessel. Their lodgings are usually taken up in the hollow of an old tree, or in some cavity of a rock by the sea side. They are sagacious in choosing the most secure retreats, because their honey is so delicious a bait, that they are hunted after by many animals; and they have no power of defending themselves, having no stings as our bees have. The combs are brittle, and the honey is clear and liquid like rock-water. It is used by the natives rather as a drink with their food than as honey. They use it also in medicine as a purge, drinking half a pint of it in the morning fasting. Clavigero, in his history of Mexico, mentions a species in every respect similar to ours, but without a sting. This is the bee of Yucatan and Chiapa, which makes the fine clear honey of Enstabentu, of an aromatic flavor, superior to that of all the other kinds of honey with which we are acquainted. Another species, described by the same author, resembles in its form the winged ant, but is smaller than the common bee; and without a sting. This insect, which is peculiar to warm and temperate climates, forms nests in size and shape resembling sugar loaves, and even sometimes greatly exceeding these in size; which are suspended from rocks, or from trees, and particularly from the oak. These hives are much more numerously peopled than those of the common bee. The nymphs of this bee, which are eatable, are white and round, like a pearl. The honey is of a grayish color, but of a very fine flavor.

With regard to the age of bees, the large drones live but a little while, being destroyed without mercy by the working bees, probably to save honey. But of the other sort, said to have been lately discovered, no larger than the working bees, and not easily to be distinguished from them, the age has not yet been ascertained. And, Mr. Bonner's statement of the fact be just, it will first be necessary to ascertain their existence. As to the age of the working bees, writers are not agreed. Some maintain that they are annual, and others suppose that they live many years. Many of them, it is well known, die annually of hard labor; and though they may be preserved by succession in hives or colonies several years, the most accurate observers are of opinion, that their age is but a year, or at the utmost not more than two summers.

These industrious insects, Mr. Bonner remarks, have their vices as well as their virtues. The most savage Indian tribes do not wage more deadly wars than the bees of different hives, and sometimes of the same hive, occasionally do. In these battles, their stings are their chief weapons; and great skill may be discovered in their manner of pointing them between the scaly rings which cover their bodies, or to some other easily vulnerable part. The bee which first gains the advantage, remains the conqueror; though the victory costs the victor his life, if he has left his sting in the body of the enemy; for with the sting so much of the body is torn out, that death inevitably follows. Bees have very severe conflicts when whole hives engage in a pitched battle, and many are slain on both sides. Their fighting and plundering one another ought chiefly to be imputed, as Mr. Thorley observes, to their perfect abhorrence of sloth and idleness, or to their insatiable thirst for honey; for when in spring or autumn the weather is fair, but no honey can be collected from plants, and is to be found only in the hives of other bees, they will venture their lives to get it there. Dr. Warder assigns another cause for their fighting; which is, the necessity that the bees are reduced to, when their own hive has been plundered, at a season when it is too late to repair the loss by any industry in the fields. Sometimes one of the queens is killed in battle: in this case, the bees of both hives unite as soon as her death is generally known among them. All then become one people; the vanquished go off with the robbers, richly laden with their own spoils, and return every day with their new associates to pillage their old habitation. This causes a throng, unusual for the season, at the door of the hive they are plundering; and if the owner lifts it up at night, when all are gone home, he will find it empty of inhabitants; though there perhaps will remain in it some honey, which he takes as his property. When two swarms take flight at the same time, they sometimes quarrel, and great numbers are destroyed on both sides, till one of the queens is slain. This ends the contest, and the bees of both sides unite under the surviving sovereign.

Mr. Wildman, by his dexterity in the management of bees, some years ago surprised the whole kingdom. He caused swarms to light where he pleased almost instantaneously; he ordered them to settle on his head, then removed them to his hand, and commanded them to depart and settle on a window, table, &c., at pleasure. We subjoin the method of performing these feats, in his own words: 'Long experience has taught me, that as soon as I turn up a hive, and give it some taps on the sides and bottom, the queen immediately appears to know the cause of this alarm; but soon retires again among her people. Being accustomed to see her so often, I readily perceive her at first glance; and long practice has enabled me to seize her instantly, with a tenderness that does not in the least endanger her person. This is of the utmost importance; for the least injury done

to her brings immediate destruction to the hive, if you have not a spare queen to put in her place, as I have too often experienced in my first attempts. When possessed of her I can, without injury to her, or exciting that degree of resentment that may tempt her to sting me, slip her into my other hand, and returning the hive to its place hold her there, till the bees missing her are all on wing and in the utmost confusion. When the bees are thus distressed, I place the queen wherever I would have the bees to settle. The moment a few of them discover her, they give notice to those near them, and those to the rest; the knowledge of which soon becomes so general, that in a few minutes they all collect themselves round her; and are so happy in having recovered this sole support of their state, that they will long remain quiet in their situation. Nay the scent of her body is so attractive to them, that the slightest touch of her, along any place or substance, will attach the bees to it, and induce them to pursue any path she takes.' This was the only witchcraft used by Mr. Wildman, and is that alone which is practised by others who have since made similar exhibitions.

When the bees begin to work in their hives they divide themselves into four companies; one of which roves in the fields in search of materials; another employs itself in laying out the bottom and partitions of their cells; a third is employed in making the inside smooth from the corners and angles; and the fourth company brings food for the rest, or relieves those who return with their respective burdens. But they are not kept constant to one employment; they often change the tasks assigned them; those that have been at work, being permitted to go abroad; and those that have been in the fields already take their places. They seem even to have signs by which they understand each other; for when any of them want food, it bends down its trunk to the bee from whom it is expected, which then opens its honey bag, and lets some drops fall into the other's mouth, which is at that time opened to receive it. Their diligence and labor are so great, that in a day's time they are able to make cells, which lie upon each other, numerous enough to contain 3000 bees. In the plan and formation of these cells they discover a most wonderful sagacity. In constructing habitations within a limited compass, an architect would have three objects in view; first to use the smallest possible quantity of materials; next to give the edifice the greatest capacity in a determined space; and thirdly to employ the spot in such a manner that none of it may be lost. On examination it will be found that the bees have obtained all these advantages in the hexagonal form of their cells; for first, there is economy of wax, as the circumference of one cell makes part of the circumferences of those contiguous to it; secondly, the economy of the spot, as these cells, which join to one another, leave no void between them; and thirdly, the greatest capacity or space; as of all the figures which can be contiguous, that with six sides gives the largest area. This thriftiness prompts them to make the partitions of their cells thin; yet they are constructed so that the solidity may compensate for the scantiness of materials. The parts most liable to injury are the entrances of the cells. These the bees take care to strengthen, by adding quite round the circumference of the apertures a fillet of wax, by which means this mouth is three or four times thicker than the sides; and they are strengthened at the bottom by the angle formed by the bottom of three cells falling in the middle of an opposite cell. The combs lie parallel to each other; and there is left between every one of them a space which serves as a street, broad enough for two bees to pass by each other. There are holes which go quite through the combs, and serve as lanes for the bees to pass from one comb to another, without being obliged to go a great way about. When they begin their combs, they form at the top of the hive a roof or stay to the whole edifice, which is to hang from it. Though they generally lay the foundations of the combs so that there shall be no more between them than what is sufficient for two bees to pass, yet they sometimes place those beginnings of two combs too far asunder; and in this case, in order to fill up part of the void space arising from that bad disposition, they carry their combs on obliquely, to make them gradually approach each other. This void space is sometimes so considerable that the bees build in it an intermediate comb, which they terminate as soon as the original combs have only their due distances. As the combs would be apt, when full, to overcome by their weight all the security which the bees can give them against falling, they who prepare hives set in them, cross-ways, sticks which serve as props to the combs, and save the bees a great deal of labor. It is not easy to discover the particular manner of their working; for, notwithstanding the many contrivances used for this purpose, there are such numbers in continual motion and succeeding one another with such rapidity that nothing but confusion appears to the sight. Some of them, however, have been observed carrying pieces of wax in their talons, and running to the places where they are at work upon the combs. These they fasten to the work by means of the same talons. Each bee is employed but a very short time in this way; but there is so great a number of them that go on in a constant succession, that the comb increases very perceptibly. Besides these there are others that run about beating the work with their wings and the hinder parts of their body, probably with a view to make it more firm and solid. While part of the bees are occupied in forming the cells, others are employed in perfecting and polishing those that are new-modelled. The operation is performed by their talons, taking off every thing that is rough and uneven. These polishers are not so desultory in their operation as those that make the cells; they work long and diligently, never intermitting their labor, except to carry out of the cell the particles of wax which they take off in polishing. These particles are not allowed to be lost; others are ready to receive them from the polishers, and to employ them in some other part of the work.

One of the chief uses of the cells is to b

nurseries for the young. The cells for those who are to be working bees are commonly half an inch deep; those for drones three quarters of an inch; and those which are intended only for keeping honey still deeper. This accounts for the inequalities observed in the surface of combs. The queen bee is generally concealed in the most secret part of the hive, and is never visible but when she lays her eggs in such combs as are exposed to sight. When she does appear, she is always attended by ten or a dozen of the common sort, who form a kind of retinue and follow her, wherever she goes, with a sedate and grave step. Before she lays her eggs she examines the cells where she designs to lay them; and if she finds that they contain neither honey, wax, nor embryo, she introduces the posterior part of her body into a cell, and fixes to the bottom of it a small white egg, which is composed of a thin white membrane, full of a whitish liquor. In this manner she goes on till she fills as many cells as she has eggs to lay, which are generally many thousands. Sometimes more than one egg has been deposited in the same cell; when this is the case, the working bees remove the supernumerary eggs, and leave only one in each cell. On the first or second day after the egg is lodged in the cell, the drone bee, or, according to Mr. Bonner the working bee, injects a small quantity of whitish liquid, which in about a day is absorbed by the egg. On the third or fourth day is produced a worm or maggot; which, when it is grown so as to touch the opposite angle, coils itself up in the shape of a semicircle, and floats in a proper liquid, whereby it is nourished and enlarged in its dimensions. This liquor is of a whitish color, of the thickness of cream, and of an insipid taste like flour and water. Naturalists are not agreed as to the origin and qualities of this liquid. Some have supposed that it consists of some generative matter, injected by the working bees into each cell, in order to give fecundity to the egg: but the most probable opinion is, that it is the same with what some writers have called the bee-bread; and that it is a mixture of water with the juices of plants and flowers, collected merely for the nutrition of the young whilst they are in their weak and helpless state. Whatever be the nature of this aliment, it is certain that the working bees are very industrious in supplying the worms with a sufficient quantity of it. The worm is fed by the working bees for about eight days, till one end touches the other in the form of a ring; and, when it begins to feel itself uneasy in its first posture, it ceases to eat and begins to unroll itself, thrusting that end forwards to the mouth of the cell which is to be the head. The attendant bees, observing these symptoms of approaching transformation, desist from their labors in carrying proper food, and employ themselves in fastening up the top of the cell with a lid of wax, formed in concentric circles, and in cherishing the brood and hastening the birth by their natural heat. In this concealed state the worm extends itself at full length, and prepares a web of a sort of silk, in the manner of the silk-worm. This web forms a complete lining for the cell, and affords a convenient receptacle for the transformation of the worm into a nymph or chrysalis. Some naturalists suppose that, as each cell is destined to the successive breeding of several worms, the whole web, which is composed of many crusts or doubles, is in reality a collection of as many webs as there have been worms. M. Maraldi apprehends that this lining is formed of the skin of the worm thrown off at its entrance into the nymph state; but it is urged that, if the cells are opened when newly covered by the bees, the worm within will be found in its own form, and detected in the act of spinning its web; and by means of glasses it will be found composed of fine threads regularly woven together, like those of other spinning animals. In the space of eighteen or twenty days the whole process of transformation is finished, and the bee endeavours to discharge itself from confinement, by forcing an aperture with its teeth through the covering of the cell. The passage is gradually dilated; so that one horn first appears, then the head, and afterwards the whole body. This is usually the work of three hours, and sometimes of half a day. The bee, after it has disengaged itself, stands on the surface of the comb till it has acquired its natural complexion, and full maturity and strength, so as to become fit for labor. The rest of the bees gather round it in this state, congratulate it on its birth, and offer it honey out of their own mouths. The exuviæ and scattered pieces of wax which are left in the cell are removed by the working bees; and the matrix is no sooner cleansed and fit for new fecundation, but the queen deposits another egg in it; insomuch that Mr. Maraldi says, he has seen five bees produced in the same cell in the space of three months. The young bees are easily distinguished from the others by their color; they are gray, instead of the yellowish brown of the common bees. The reason of this is, that their body is black, and the hairs that grow upon it are white, from the mixture of which seen together results a gray; but this color forms itself into a brownish yellow by degrees, the rings of the body becoming more brown and the hairs more yellow. The eggs from which drones are to proceed are, as already observed, laid in larger cells than those of the working bees. The coverings of these cells, when the drones are in the nymph state, are convex or swelling outward, whilst the cells of the working bees are flat. This, with the privilege of leading idle effeminate lives, and not working for the public stock, is what distinguishes the drones. The bees depart from their usual style of building when they are to raise cells for bringing up such maggots as are destined to become queens. These are of a longish oblong form, having one end bigger than the other, with their exterior surface full of little cavities. Wax, which is employed with so geometrical a thriftiness in the raising of hexagonal cells, is expended with profusion in the cell which is to be the cradle of a royal maggot. They sometimes fix it in the middle, and at other times on one side of a comb. Several common cells are sacrificed to serve as a basis and support to it. It is placed almost perpendicular to the common cells, the largest end being uppermost. The lower end is open till the season for closing it comes, or till the maggot is ready for transformation. It

would be difficult to conceive how a tender maggot can remain in a cell turned bottom upmost, if we did not find it buried in a substance scarcely fluid, and if it was not in itself, at first, small and light enough to be suspended in this clammy paste. As it grows it fills all the upper and larger part of the cell. As soon as the young queen comes out of her cell, that cell is destroyed, and its place is supplied by common cells; but, as the foundation of the royal cell is left, this part of the comb is found thicker than any other. There are several such cells prepared; for, if there was only one reared in each hive, the swarms might often want a conductress. Many accidents might also destroy the little maggot before it becomes a bee. It is therefore necessary that a number of such cells should be provided; and accordingly there are observed several young queens in the beginning of the summer, more than one of which often takes flight when a swarm departs. A young queen is in a condition to lead a swarm, from a hive in which she was born, in four or five days after she has appeared in it with wings. The bees of a swarm are in a great hurry when they know that their queen is ready to lay. In this case they give their new cells but part of the depth they are to have, and defer the finishing of them till they have traced the number of cells requisite for the present time. The cells first made are intended only for working bees; these being the most necessary.

Besides the instincts above mentioned, bees are possessed of others, some of which are equally necessary for their preservation and happiness. They anxiously provide against the entrance of insects into the hive, by gluing up with wax or propolis the smallest holes in it. Some stand as sentinels at the mouth of the hive, to prevent insects of any kind from getting in. But if a snail or other large insect should get in, notwithstanding all resistance they sting it to death; and then cover it over with a coat of propolis, to prevent the bad smell or maggots which might proceed from the putrefaction of such a large animal. Bees seem to be warned of the appearance of bad weather by some particular feeling. It sometimes happens, even when they are very assiduous and busy, that they on a sudden cease from their work; not a single bee stirs out; and those that are abroad hurry home in such prodigious crowds, that the doors of their habitations are too small to admit them. On such occasions, if we look up to the sky, we shall soon discover some of those black clouds which denote impending rain. Whether they see the clouds gathering, as some imagine, or whether (as is more probable) they feel some peculiar sensation upon their bodies, is not yet determined; but it is alleged, that no bee is ever caught even in what we call a sudden shower, unless it has been at a very great distance from the hive, or has been before injured by some accident, or be sickly and unable to fly so fast as the rest. Cold is very hurtful to bees. To defend themselves against its effects during a hard winter, they crowd together in the middle of the hive, and buzz about, and thereby excite a warmth, which is often perceptible by laying the hand upon the glass windows of the hive. They seem to understand one another by the motions of their wings: when the queen wants to quit the hive she gives a little buzz; and all the others immediately follow her example, and retire along with her.

The habitations of bees ought to be very close; and what their hives want from the negligence or unskilfulness of man, these animals supply by their own industry; so that it is their principal care, when first hived, to stop up all the crannies. For this purpose they make use of a resinous gum, which is more tenacious than wax, and differs greatly from it. This the ancients called propolis. It will grow considerably hard in the hive, though it will in some measure soften by heat; and is often found different in consistence, color, and smell. It has generally an agreeable aromatic odor when it is warmed; and by some it is considered as a most grateful perfume. When the bees begin to work with it, it is soft; but it acquires a firmer consistence every day, till at length it assumes a brown color, and becomes much harder than wax. The bees carry it on their hinder legs: and some think it is met with on the birch, the willow, and the poplar. However it is procured, it is certain that they plaster the inside of their hives with this composition.

Various experiments have been made of late years, by which new light has been thrown upon the subject of the generation of bees. Swammerdam and Maraldi having discovered in the structure of the drones some resemblance to the male organs of generation, from thence concluded that they were males; but neither of those accurate and industrious observers could detect them in the act of copulation, as Mr. Bonner has justly observed. Swammerdam, therefore, entertained a notion, that the female or queen bee was fecundated without copulation; that it was sufficient for her to be near the males; and that her eggs were impregnated by a kind of vivifying aura, exhaled from the body of the males, and absorbed by the female. However, Mr. Reaumur thought that he had discovered the actual copulation of the drones with the female bee, and has very minutely described the process of it. M. Barbut, in his Genera of Insects, (p. 268.) without taking any notice of recent discoveries, seems to have adopted the same idea. 'The office of the males or drones,' says he, 'is to render the queen pregnant. One single female would in the midst of 700 or 800 males, one would think, be incessantly assailed. But nature has provided against that inconvenience, by making them of a constitution extremely frigid. The female chooses out one that pleases her; she is obliged to make the first advances, and excite him to love her by her caresses. But this favour proves fatal to him; scarcely has he ceased from amorous dalliance but he is seen to perish. These observations may be made, by putting a female with several males into a bottle.' Others again, as M. Schirach, M. Hattorff, and M. Bonner, reject the drones as bearing no share at all in the business of propagation, and assert the queen bee to be self-prolific. But for what purpose then should the drones be furnished with that large quantity of seminal liquor? to what use so large an apparatus of fecundating organs so well described by Reaumur and Maraldi

The above gentlemen seem to have founded their opinion upon observations, that hives are peopled at a time of the year when (as they supposed) there are no drones in being. But, if Mr. Debraw's discoveries be true, nature has provided drones of different sizes for the purpose of impregnation, adapted to different times, occasions, and circumstances: and the opinions of Messrs. Schirach and Hattorff seem to have been founded upon their missing the large sized drones, and not being acquainted with, or not adverting to, the other sort, so hardly distinguishable from the working bees. Mr. Bonner's laborious but fruitless searches, however, for these little drones, render the matter at least still dubious, if they do not entirely overturn Mr. Debraw's whole system. Many of the ancients as well as moderns have supposed, that the eggs of the female bee are not impregnated with the male sperm while in the body of the creature, but that they are deposited unimpregnated in the cells; and that the male afterwards ejects the male sperm on them as they lie in the cells, in the same manner as the generation of fishes is supposed to be performed, by the males impregnating the spawn after it is cast out by the females. M. Maraldi long since conjectured that this might be the case; and he was confirmed in this opinion by observing a liquid whitish substance surrounding each egg, at the bottom of the cell, a little while after it had been laid; and that a great number of eggs, which were not encompassed by this liquor, remained barren in the cell. This method of impregnation has been lately attempted to be established by the observations of Mr. Debraw of Cambridge. Having put some bees into glass hives, with a large number of drones, he observed on the first or second day (always before the third), from the time in which the eggs were placed in the cells, which the queen generally lays on the fourth or fifth day after they are put into the hive, that a great number of bees fastened themselves to one another, and formed a kind of curtain from the top to the bottom of the hive, probably in order to conceal the process of generation. Mr. Debraw, however, could soon perceive several bees, whose size he was not able to distinguish, inserting the posterior part of their bodies each into a cell, and sinking into it; after a little while they retired, and he could see with the naked eye a small quantity of whitish liquor, left in the angle of the base of each cell, containing an egg; this liquor was less liquid than honey, and had no sweet taste. In order to prove further, that the eggs are fecundated by the males, and that their presence is necessary at the time of breeding, Mr. Debraw made the following experiments. He left in a hive the queen, with only the working bees, without any drones, to see whether the eggs she laid would be prolific. To this end he took a swarm, and shook all the bees into a tub of water, leaving them there till they were quite senseless; by which means he could distinguish the drones, without any danger of being stung: leaving these out, therefore, he restored the queen and working bees to their former state, by spreading them on a brown paper in the sun; after this he replaced them in a glass hive, where they soon began to work as usual. The queen laid eggs, which, to his great surprise, were impregnated; for he imagined he had separated all the drones or males, and therefore omitted watching them; at the end of twenty days he found several of his eggs had, in the usual course of changes, produced bees, while some had withered away, and others were covered with honey. Hence he inferred that some of the males had escaped his notice, and impregnated part of the eggs. To convince himself of this he took away all the brood comb that was in the hive, to oblige the bees to provide a fresh quantity, being determined to watch narrowly their motions after new eggs should be laid in the cells. On the second day, after the eggs were placed in the cells, he perceived the same operation repeated, of the bees hanging down in the form of a curtain, while others thrust the posterior part of their bodies into the cells. He then introduced his hand into the hive, and broke off a piece of the comb, in which there were two of these insects; he found in neither of them any sting: upon dissection, with the assistance of a microscope, he discovered the four cylindrical bodies which contain the glutinous liquor, of a whitish color, as observed by Maraldi in the large drones. He was therefore now under a necessity of repeating his experiments, in destroying the males, and even those which might be suspected to be such. He once more immersed the same bees in water; and when they appeared in a senseless state, he gently pressed every one, in order to distinguish those armed with stings from those which had none, and which of course he supposed to be males: of these last he found fifty-seven, and replaced the swarm in a glass hive, where they immediately applied again to the work of making cells; and on the fourth or fifth day he had the pleasure to see the queen bee deposit her eggs in those cells. He continued watching most part of the ensuing days, but could discover nothing of what he had seen before. The eggs after the fourth day, instead of changing in the manner of caterpillars, were found in the same state that they were the first day, except that some were covered with honey. A singular event happened the next day about noon: all the bees left their own hive, and attempted to get into a neighbouring hive, probably in search of males; but the queen was found dead, having been killed in the engagement. To be further satisfied, Mr. Debraw took the brood comb, which had not been impregnated, and divided it into two parts: one he placed under a glass bell, marked No. 1. with honey-comb for the bees' food, taking care to leave a queen, but no drones among the bees confined in it: the other piece of brood comb he placed under another glass bell, No. 2. with a few drones, a queen, and a proportionable number of common bees. The result was, that in the glass No. 1. there was no impregnation, the eggs remained in the same state they were in when put into the glass; and on giving the bees their liberty on the seventh day, they all flew away, as was found to be the case in the former experiment: whereas in the glass No. 2., the very day after the bees had been put into it, the eggs were impregnated by the drones; the bees did not leave their hives on receiving their liberty; the eggs at the

[illegible] the necessary transformation [illegible] numerous young colony was produced. Naturalists have observed, that the queen [illegible] in a manner peculiar to themselves, different from the drones and working bees. We have supposed, that the eggs laid by the queen in a hive, and destined for the production of queen bees, are of a peculiar kind; but though this is not the case, as M. Schirach has lately discovered, yet there are particular cells appropriated for this purpose. These cells are placed near the edges, and at the bottom of the combs, and sometimes on the sides of a honeycomb: they are of an oblong orbicular form, and very strong; and are more or less numerous in different hives, as occasion seems to require. It has been also supposed, that the matter with which they are nourished is of a different kind and quality from that employed for the nourishment of the other bees; that which has been collected out of the royal cells being of a gummy glutinous nature, and of a deep transparent red, and dissolving in the fire rather than crumbling to powder. It was long supposed that the queen bee was the only female contained in the hive; and that the working bees were neutral, or of neither sex. But M. Schirach has lately established a different doctrine, which has been also confirmed by the latter observations of Mr. Debraw and Mr. Bonner. According to M. Schirach, all the working or common bees are females in disguise; and the queen bee lays only two kinds of eggs, viz. those which are to produce the drones, and those from which the working bees are to proceed; and from any one or more of these, one or more queens may be produced; so that every worm of the latter or common kind, which has been hatched about three days, is capable, under certain circumstances, of becoming the queen, or mother of a hive. In proof of this doctrine, new and singular as it may seem, he alleges a number of satisfactory and decisive experiments, which have been since verified by those of Mr. Debraw and Mr. Bonner. The final result of these experiments is, that a colony of working bees shut up with a piece of common brood comb, not only hatch it, but are found, at the end of eighteen or twenty days, to have produced from thence one or two queens; which have apparently proceeded from worms of the common sort, pitched upon by them for that purpose; and which, if they had remained in the old hive, (there is reason to suppose) would have been changed into common working bees. Hence we may justly infer, that the government of the bees is not a jure divino, or hereditary monarchy, but an elective one, in which the choice of their future ruler is made by the body of the people, while she is yet in the cradle, or in embryo; who are determined by motives of preference, which will perhaps for ever elude the penetration of the most sagacious naturalists. The conclusions drawn by M. Schirach, from experiments of this kind, often repeated by himself, Mr. Bonner, and others, with the same success, are, that all the common or working bees were originally of the female sex; but that when they have undergone their last metamorphosis, they are condemned to a state of perpetual virginity, and the organs of generation are obliterated; merely because they have not been lodged, fed, and brought up in a particular manner, while they were in the worm state. These authors suppose that the worm designed by the community to be a queen, or mother, owes its metamorphosis into a queen, partly to the extraordinary size of its cell, and its peculiar position in it, but principally to a certain appropriate nourishment found there, and carefully administered to it by the working bees while it was in the worm state; by which, and possibly other means unknown, the development and extension of the germ of the female organs, previously existing in the embryo, is effected; and those differences in its form and size are produced, which afterwards so remarkably distinguish it from the common working bees. This discovery is capable of being applied towards forming artificial swarms, or new colonies of bees, by which means their number might be increased, and their produce in honey and wax proportionally augmented. We cannot conclude this subject without taking notice of a conjecture, suggested by Mr. Bonner, or rather by a friend of his, respecting the fecundation of the queen bee, which, however singular it may appear, is not without analogy in the natural history of insects. See Aphis. Mr. Bonner mentions, that in a conversation with two intelligent gentlemen after seeing his experiments, proving that queens lay eggs, which produce queens, commons, and drones, without having ever seen a drone, they asked him, 'What then is the use of the drone?' 'In answer to this, I candidly acknowledged, that I could not tell, as any conjecture that I could form respecting their use appeared to be attended with insurmountable objections. We all agreed, however, that they certainly must be of some use, as nature, or, more properly speaking, the God of nature, does nothing in vain. One of the gentlemen said, that perhaps bees might be like some other insects, whose males were not necessary in every act of generation; and that, perhaps, although a queen bee who had never seen a drone could lay an egg which would produce a queen, and that queen again do the same, and thus the production of queens and bees be continued with equal success, for perhaps six, eight, or ten generations, yet it might perhaps turn out, that these queens would gradually become more and more unfruitful, and at last grow altogether barren, unless they should cohabit with the drones. The other gentleman, however, was of opinion that if one queen was fruitful without the agency of the drones, every other one would be so likewise to the end of the world. There is one thing, however, that seems to favor the former gentleman's conjecture; viz. that some hives which had not a single drone in them, have been known to breed well for one summer, pretty well the next, and even tolerably the third; but at last have bred drones, and thereby turned out much more prolific thereafter; although it must be owned that such hives generally fail at last. Seeing the drones are great consumers of honey, though they do nothing to provide any; should the above conjecture, therefore, turn out to be true, a practical inference may be drawn, that

hive may thrive fully as well, or rather better, for three or four years, without drones than with them; after which period, they might again be introduced into the hive, for the purpose of renewing the prolific powers of the queen, and preventing the royal race from becoming barren or extinct. It may be farther observed, as an additional argument in favor of the above conjecture, that although the queen and her daughter, none of whom ever saw a drone, might lay abundance of eggs, which would all produce bees, yet they might probably have laid a great many more, had the drones been in the hive with them. I must confess it appears somewhat paradoxical, to say that females will breed successively for several generations without the assistance of the males; and yet at last prove barren, and give over breeding altogether, till their prolific powers are renewed by fresh males cohabiting with them. But however paradoxical or unaccountable it may appear, that is not a sufficient reason to reprobate the supposition; as there are many of the arcana of nature that are equally wonderful and unaccountable, and the elucidation of which has hitherto baffled the investigation of the most penetrating geniuses, and deepest inquirers into the secrets of natural philosophy.' Mr. Bonner adds, that one of these gentlemen offered him the use of his hives to try an experiment in proof of this theory, which he promises to execute the first leisure opportunity, and lay the result before the public; which, if it shall prove satisfactory, will entirely set aside Mr. Debraw's doctrine of the little drones; the existence of which is utterly denied by Mr. Hunter, a late English writer upon the subject, as well as by Mr. Bonner. Mr. Hunter considers the doctrine as merely calculated to furnish a convenient link in the chain of a favorite hypothesis.

Honey is originally a juice digested in plants, which sweats through their pores, and chiefly in their flowers, or is contained in reservoirs in which nature stores it. The bees sometimes penetrate into these stores, and at other times find the liquor exuded. This they collect in their stomachs; so that, when loaded with it, they seem, to an attentive eye, to come home without any booty at all. Besides the liquor already mentioned, which is obtained from the flowers of plants, another substance, called honey-dew, has been discovered, of which the bees are equally fond. Of this substance there are two kinds, both deriving their origin from vegetables, though in very different ways. The first kind, the only one known to husbandmen, and which passes for a dew that falls on trees, is no other than a mild sweet juice, which, having circulated through the vessels of vegetables, is separated in proper reservoirs in the flowers, or on the leaves, where it is properly called the honey-dew; sometimes it is deposited in the pith, as in the sugar-cane; and, at other times, in the juice of pulpy summer fruits when ripe. Such is the origin of the manna which is collected on the ash and maple of Calabria and Briançon, where it flows in great plenty from the leaves and trunks of these trees, and thickens into the form in which it is usually seen. The second kind of honey-dew, which is the chief resource of bees, after the spring flowers and dew by transpiration on leaves are past, owes its origin to a small insect, (see APHIS,) the excrement thrown out by which makes a part of the most delicate honey we ever taste. From whatever source the bees have collected their honey, the instant they return home they seek cells in which they may disgorge and deposit their loads. They have two sorts of stores; one of which consists of honey laid up for the winter, and the other of honey intended for accidental use in case of bad weather, and for such bees as do not go abroad in search of it. Their method of securing each of these is different. They have in each cell a thicker substance, which is placed over the honey to prevent its running out of the cell; and that substance is raised gradually as the cell is filled, till the bees, finding that the cell cannot contain any more, close it with a covering of wax, not to be opened till times of want, or during the winter.

The queen and working bees are armed with stings; when the whole sting is examined by a microscope along with a small needle, which has received the finest polish that human art can give it, the sting exhibits all over the most beautiful polish, without the least flaw, blemish, or inequality; while the needle appears full of holes, scratches, and ruggedness, like an iron bar from a smith's forge. Yet this fine polished instrument is only the sheath of others still more exquisitely fine and curious. This fine horny sheath, or scabbard, includes two bearded darts. This sheath ends in a sharp point, near the extremity of which a slit opens, through which, at the time of stinging, the two bearded darts are protruded beyond the end of the sheath: one of these is a little longer than the other, and fixes its beard first; and the other instantly following, they penetrate alternately deeper and deeper, taking hold of the flesh with their beards or hooks, till the whole sting is buried in the flesh; and then a venomous juice is injected through the sheath, from a little bag at the root of the sting. Hence the wound occasions an acute pain and swelling of the part, which sometimes continue several days. These effects are best remedied by enlarging the wound directly, to give it some discharge. This poison seems to owe its mischievous efficacy to certain pungent salts. Let a bee be provoked to strike its sting against a plate of glass, and there will be a drop of the poison discharged, and left upon the glass. This being placed under a double microscope, as the liquor evaporates the salt will be seen to concentrate, forming oblong, pointed, clear crystals. Mr. Derham counted on the sting of a wasp eight beards on the side of each dart, somewhat like the beards of fish-hooks; and the same number is to be counted on the darts of the bee's sting. When these beards are stuck deep in the flesh, if the wounded person starts, or discomposes the bee before it can disengage them, the sting is left behind sticking in the wound: but if he have patience to stand quiet, the creature brings the hooks down close to the sides of the darts, and withdraws the weapons, in which case the wound is always much less painful. The danger of being stung by bees may be in a great manner prevented by

a quiet composed behaviour. A thousand bees will fly and buzz about a person without hurting him, if he stand perfectly still and forbear disturbing them even when near his face, in which case he may observe them for hours together without danger; but if he molests or beats them away, he usually suffers for it. It has been affirmed, that a person is in perfect safety in the midst of myriads of bees, if he but carefully keep his mouth shut, and breathe gently through the nostrils only; the human breath, it would seem, being peculiarly offensive to their delicate organs: and merely with this precaution, the hives may be turned up, and even part of the comb cut out, while the bees are at work.

A hive of bees has often been likened to a well-peopled city, consisting of between 15,000 and 18,000 inhabitants; and its government has been generally supposed to be an absolute monarchy, wherein the queen governed with unlimited sway. But Mr. Bonner shows that it is rather a republic, or at most a large family of dutiful children, over whom the queen-mother presides with a mild and parental authority; the far greater part of her subjects being in fact her own offspring. When a hive is become too much crowded by the addition of the young brood, a part of the bees think of finding themselves a more commodious habitation; and with that view single out the most forward of the young queens. A new swarm is, therefore, constantly composed of one queen at least, and of several thousand working bees, as well as of some hundreds of drones. The working bees are some old, some young. Scarce has the colony arrived at its new habitation, when the working bees labor with the utmost diligence to procure materials for food and building. Their principal aim is not only to have cells in which they may deposit their honey; but a stronger motive seems to animate them—they seem to know that their queen is in haste to lay her eggs. Their industry is such, that in twenty-four hours they will have made combs twenty inches long, and wide in proportion. They make more wax during the first fortnight, if the season is favorable, than they do during all the rest of the year. Other bees are at the same time busy in stopping all the holes and crevices they find in the new hive, in order to guard against the entrance of insects which covet their honey, their wax, or themselves; and also to exclude the cold air; for it is indispensably necessary that they be lodged warm. When the bees first settle in swarming; indeed, when they at any time rest themselves, there is something very particular in the method of taking their repose. It is done by collecting themselves in a heap, and hanging to each other by their feet. They sometimes extend these heaps to a considerable length. It would seem probable to us, that the bees from which the others hang must have a considerable weight suspended to them. All that can be said is, that the bees must find this to be a situation agreeable to themselves. They, perhaps, have a method of distending themselves with the air, thereby to lessen their specific gravity; as fishes do, to alter their gravity compared with water. When a swarm divides into two or more bands, which settle separately, this division is a sure sign that there are two or more queens among them. One of these clusters is generally larger than the other. The bees of the smaller cluster, or clusters, detach themselves by little and little, till at last the whole, together with the queen or queens, unite with the larger cluster. As soon as the bees are settled, the supernumerary queen, or queens, must be sacrificed to the peace and tranquillity of the hive. This execution generally raises a considerable commotion in the hive; and several other bees, as well as the queen or queens, lose their lives. Their bodies may be observed on the ground near the hive. The queen that is chosen is of a more reddish color than those which are destroyed; so that fruitfulness seems to be a great motive of preference in bees; for the nearer they are to the time of laying their eggs, the bigger, redder, and more shining are their bodies.

Plate I. Apis. Fig. 1. represents the queen bee. 2. The drone. 3. The working bee. 4. The bees hanging to each other by the feet, which is their method of taking repose. 5. The proboscis or trunk, which is one of the principal organs of the bees, wherewith they gather the honey, and take their nourishment. 6. One of the hind-legs of a working bee, loaded with wax. 7. A comb, in which the working bees are bred. The cells are the smallest of any. Two of them have the young bees enclosed. A royal cell is suspended on one side. 8. A comb in which the drones are bred, being larger than the former; the young drones being included in several of them, with two royal cells suspended on one side. 9. A similar comb, in which the royal cell is fixed in the middle of the comb; and several common cells are sacrificed to serve as a basis and support to it. In general, the royal cells are suspended on the side of a comb, as in fig. 7, 8. On the side of fig. 9, two royal cells are represented as begun, when they resemble pretty much the cup in which an acorn lies. The other royal cells have the young queens included in them. Fig. 10 exhibits the sting and all its parts, as seen through the miscroscope, viz. *a*, the sheath and two shanks, united to each other, and terminating in a sharp point, so as to look like a single part. *b*, The poisonous bag. *c*, The tube that serves to convey the poison from its bag to the thickest part of the sheath. *d d*, The two shanks of the sting mutually conveying to each other. *e e*, The sheath of the sting. *f f*, The thickest end of the sheath, where the tube opens into it, by which it receives the insect's poison. *g*, The extreme point of the sting, formed by the two shanks of that organ, that are in this place closely united. *h h*, The beards with which the shanks of the sting are armed at their extremities. *i*, The tube that serves to secrete the poison, which it discharges into the poison bag. *k k*, The two blind extremities of the said tube. *l l l l*, Two pair of cartilages, of different forms, which are for the most part of a deep black, and articulated among themselves and with the shanks of the sting. *m m*, Two other cartilages, almost entirely membranaceous, but less conspicuous than the former, with one pair of which they are articulated.

nnnnnnnn, Eight places, in which the foregoing cartilages are articulated among themselves, and with the shanks of the sting *d d*.—*oooo*, Four muscles serving to move the sting different ways, by the assistance of the same cartilages *p p*, Two muscles which draw the shanks of the sting into its sheath. *q q*, Two appendages of the sting which are moved along with it, and seem to answer no other purpose but that of ornament. Fig. 11, The ovary. Fig. 12, Six eggs drawn after nature, and placed on their ends: these eggs are oblong, very slender, but somewhat thicker on their upper parts. Fig. 13, An egg viewed with a microscope: it resembles the skin of a fish, divested of its scale, but still retaining the marks of their insertion. Fig. 14, Worms of bees of different sizes, drawn after nature. *a*, A worm newly hatched. *b c d e*, Four worms that received more nourishment, and are more grown. *f g*, Two worms still larger than the former, having had more time to make use of the nourishment provided for them. They are here represented as they lie doubled in their cells. *h*, A worm placed on its belly, so as to show on its back a black line, inclining to a light blue or gray. This line denotes the stomach, which appears in this place through the transparent parts that lie over it. *i*, A worm lying on its back, and beginning to draw in the hinder part of its body, and move its head. Fig. 15, A full-grown worm viewed with a microscope. *a a*, Its fourteen annular incisions or divisions. *h*, The head and eyes, &c. *c c c*, Ten breathing holes. Fig. 16, The worm forming its web. *a a*, The sides of the cell that contains it. *b*, The bottom of the cell. *c*, The entrance or door of the cell. The worm is here represented as making its web in the properest manner to shut up this entrance. Fig. 17, The worm taken out of the web in which it had enclosed itself, and just ready to cast its skin. Fig. 18, A cell containing the worm changed into a nymph, and perfectly lined with the said worm's web. Likewise the said web entire, with the nymph contained in it, as they appear on opening the cell. *a a*, The sides of the cell lined with the worm's web. *b*, The mouth of the cell, perfectly closed by the web. *c*, The bottom of the cell. *d*, The web entire, as it appears on opening the cell, which it greatly resembles in form. *e*, The upper part of the web, of a convex form. This part shows its filaments pretty distinctly. *f*, The enclosed nymph appearing through the transparent sides of the web. *g*, The bottom of the web, answering to that of the wax cell. Fig. 19, A worm changed to a nymph, of its natural size and form, yet so as to exhibit its limbs, which are folded up in a most wonderful manner. Fig. 20, The nymph of the bee viewed with the microscope, displaying, in a distinct manner, all the parts of the enclosed insect, and the beautiful manner in which they are laid up. *a*, The head bloated with humors. *b b*, The eyes, projecting considerably. *c c*, The antennæ, or horns. *d*, The lip. *e e*, The teeth, or jaw-bones. *f f*, The first pair of joints belonging to the proboscis. *g h*, The proboscis. *i i*, The first pair of legs. *k k*, Two transparent stiff little parts, lying against the lowest joints of the first pair of legs. These little parts are not to be found, as they remain in the skin it sheds on quitting the nymph state. *l l*, The second pair of legs. *m m*, The wings. *n n*, The blade bones. *o o*, The last pair of legs. *p p*, The abdominal rings. *q*, The hinder part of the body. The sting projects a little in this place. *r*, Two little parts accompanying the sting. *s*, The anus. Fig. 21. *a*, A cell full of bee-bread, placed in layers. *b*, Little grains, of which that substance, viewed with the microscope, appears chiefly to consist.

The balls which we see attached to the legs of bees returning to the hives, are not wax, but a powder collected from the stamina of flowers, not yet brought to the state of wax. The substance of these balls, heated in any vessel, does not melt as wax would do, but becomes dry, and hardens; it may even be reduced to a coal. If thrown into water it will sink, whereas wax swims. To reduce this crude substance into wax, it must first be digested in the body of the bee. Every bee, when it leaves the hive to collect this precious store, enters into the cup of the flower, particularly such as seem charged with the greatest quantity of this yellow farina. As the animal's body is covered over with hair, it rolls itself within the flower, and quickly becomes quite covered with the dust, which it soon after brushes off with its two hind legs, and kneads it into two little balls. In the thighs of the hinder legs, there are two cavities, edged with hair; and into these, as into a basket, the animal sticks its pellets. Thus employed, the bee flits from flower to flower, increasing its store, and adding to its stock of wax, until the ball upon each thigh becomes as big as a grain of pepper; by this time having got a sufficient load, it returns, making the best of its way to the hive. After the bees have brought home this crude substance, they eat it by degrees; or, at other times, three or four bees come and ease the loaded bee, by eating each of them a share, the loaded bee giving them a hint so to do. Hunger is not the motive of their thus eating the balls of waxy matter, especially when a swarm is first hived; but it is their desire to provide a speedy supply of real wax for making the combs. At other times, when there is no immediate want of wax, the bees lay this matter up in repositories, to keep it in store. When this waxy matter is swallowed, it is by the digestive powers of the bee converted into real wax, which the bees again disgorge as they work it up into combs; for it is only while thus soft and pliant from the stomach, that they can fabricate it properly. That the wax thus employed is taken from their stomach, appears from their making a considerable quantity of comb soon after they are hived, and even on any tree or shrub where they have rested but a short while before their being hived; though no balls were visible on their legs, excepting those of a few which may be just returned from the field. This is farther confirmed by what happened in a swarm newly hived: for two days together, from the time of their quitting their former home, it rained constantly, insomuch that not one bee was able to stir out during that time; yet, at the end of two days, they had made a comb fifteen

or sixteen inches long, and thick in proportion. The crude wax, when brought home by the bees, is often of as different colors as are the flowers from which it is collected: but the new combs are always of a white color, which is afterwards changed only by the impurities arising from the steam, &c. of the bees. Bees collect crude wax also for food; for, if this was not the case, there would be no want of wax after the combs are made; but they are observed, even in old hives, to return in great numbers loaded with such matter, which is deposited in particular cells, and is known by the name of bee-bread. We may guess that they consume a great deal of this substance in food, by the quantity collected; which, by computation, may in some hives amount to a hundred weight in a season, whilst the real wax in such a hive does not exceed perhaps two pounds. Mr. Hunter, in vol. lxxxii. of the Philosophical Transactions, asserts that 'the bee-bread is the substance intended for the nourishment of the young animal when it escapes from the egg. The wax,' he says, 'is an external secretion from the body of the bee, and discoverable between each of the scales of the under side of its belly. A quantity of these thin portions collected together, and held to a candle on a pin's point, immediately melted into a little globe; whilst no such effect followed the exposure of farina from the hind legs of the bee.' Mr. Thorley says the bees carry the wax home from the fields in fine small scales between the folds of their bodies. 'Upon the belly of a bee,' says he, 'within the plaits, were fixed six pieces of solid wax, perfectly white and transparent like gum.' Mr. Bonner combats these opinions, and argues 'that Mr. Thorley, and probably some others, have seen bees carrying such white scales, or pieces of solid wax, on their bodies, once or twice perhaps in their lives, I will not dispute. I myself have seen the same phenomenon, once, or at most twice, during an experience of thirty years. But it certainly would be absurd to infer from these rare cases, that all the wax which the combs are made of, is carried into the hive in this manner. The contrary inference must be drawn, were it from nothing else but the consideration that these white scales have been so very seldom observed.. It is also well known, that when a young swarm is newly set down, within a short time thereafter, small scales of fine white wax will be seen on the stool; which is a certain proof that the bees are beginning to build combs: and perhaps a few of the bees may pick up some of these scales, to prevent them from being lost. But if every bee that is employed in carrying wax for building the combs, either within or on the outside of her body, could be observed, we should see thousands thus loaded every day after a young swarm is first set down, instead of observing only one or two solitary instances in the course of twenty or thirty years. If a natural or artificial swarm is confined twenty-four hours in a hive, after it is newly put into it, the bees will be found busily employed in making combs. From this it may be argued, that the bees, having eaten a quantity of bee-bread on purpose, before they left their own hive, and having it still in their stomachs, had made wax of it to erect the combs. Of this fact any person may convince himself, by driving the bees out of any hive into an empty one, and confining them twenty-four hours; after which, upon examining the hive attentively, he will find a piece of comb, perhaps six or eight inches long, besides several hundreds of scales lying on the stool. It is evident, then, that these scales could not be brought from the field, as Mr. Thorley supposes, seeing the bees were out of the hive: and it is farther to be observed, that when they are at full liberty to work in the fields, and when a young swarm is most busily employed in rearing combs, nothing can be seen on their bodies of these scales, or any thing else. I have sometimes, indeed, been inclined to think, that the wax might be an excrescence, exudation, or production from the bodies of the bees; and that, as the queen bee can lay eggs when she pleases, if need require, so the working bees can produce wax from the substance of their own bodies. If this conjecture be right, it will follow of course that all the food which the bees take contributes to the formation of wax, in the same manner as all the food which a cow eats contributes to the production of milk; or, to adopt a more near simile from the insect tribe, as all the food which a spider takes contributes not only to the nourishment of the animal, but to the production of the substance of the cobweb from its body. Numberless other analogies in nature might be adduced in favor of the probability of this theory. The silk, for instance, produced from the body of the silkworm, is a substance as different from that of the animal itself, or of the mulberry leaf it feeds on, as wax is from that of the body of the bee, or of the honey or flower she sucks. And the excrescence produced in the human ear, which also goes by the name of wax, is certainly a substance as different from that of the body which produces it, as either the one or the other. Upon the whole, until I meet with a more probable theory, supported by facts, I must give it as my humble opinion, that the wax is either produced from the bodies of the bees alone, or rather that the bees can speedily convert what they bring from the flowers into it, and therewith build their combs, and seal up both their young and their honey.'

Many authors have written on bees. Among the ancients, Aristomachus is said to have studied them fifty-eight or sixty years. Philiseus retired into a desert wood, that he might observe them to better advantage. Aristotle made a great number of curious observations on this insect which Virgil put into Latin verse, and which have been enlarged and confirmed by Pliny, Columella, Varro, and others. Theophrastus has a fragment still extant, περι μελιττων, concerning bees; or, as entitled in Laertius, περι μελιτος, of honey. Among the moderns, prince Frederic Cesi, institutor of the Roman Academy of Sciences, wrote expressly on bees; but it is not known what became of the MS. nor of that promised by Swammerdam on the anatomy of the bee, the want of which has been much regretted. Schirach, Bonnet, Maraldi, Reaumur and other foreigners have also largely treated of bees. Among the English, Butler, Gurney

Mills, Levets, Thorley, Southern, Remnant, Hartlib, Rusden, Warder, White, T. and D. Wildman, Purchas, Geddie, Bradley, Keys, S. and W. White, &c. have written treatises on bees; and among the Scots, Messrs. Maxwell and Bonner; the latter of whom has published two treatises on the subject.

Having thus described the natural history, economy, instincts, labors, &c. of these insects, as well as enumerated the principal authors who have written upon them, we now proceed to give an account of the best methods of managing them; and of the most improved inventions whereby we may save their lives, while we appropriate the product of their labors to our own use. This branch of the subject comprehends the whole of what some authors style Bee Husbandry; and includes directions respecting, 1. the Apiary; 2. the Erection; and 3. the purchasing of Hives; 4. the Hiving of Swarms; 5. the Uniting of Swarms; 6. the Shifting the Hives; 7. the Feeding of Bees; 8. the Taking their Honey and Wax, the Preservation of their Lives, &c.

Under the article APIARY are digested the best modern observations on the subject; we have only to add here those of Columella. He directs, that the apiary face the south, and be situated in a place neither too hot nor too much exposed to the cold; that it be in a valley, in order that the loaded bees may with the greater ease descend to their homes; that it be near the mansion-house, on account of the conveniency of watching them; but so situated as not to be exposed to noisome smells, or to the din of men or cattle; that it be surrounded with a wall, which, however, should not rise above three feet high; that, if possible, a running stream be near them; or, if that cannot be, that water be brought near them in troughs, with pebbles or small stones in the water, for the bees to rest on while they drink; or that the water be confined within gently declining banks, that the bees may have safe access to it; as they cannot produce either combs, honey, or food for their maggots, without water; that the neighbourhood of rivers or basins of water with high banks be avoided, because winds may whirl the bees into them, and they cannot easily get on shore from thence to dry themselves; and that the garden in which the apiary stands be well furnished with such plants as afford the bees plenty of good pasture. The trees in this garden should be of the dwarf kind, and their heads bushy, that the swarms which settle on them may be the more easily hived. Columella enumerates many plants fitted to a warm climate; such as thyme, the oak, the pine, the sweet-smelling cedar, and all fruit trees. Experience has taught us, that furze, broom, mustard, clover, heath, &c. are excellent for this purpose. Pliny recommends broom in particular, as a plant exceedingly grateful and very profitable to bees. Mr. Bonner has a long chapter on the pasturage proper for bees; for which we must refer the reader to his work.

As to their erection, 'Hives,' says Mr. Bonner, 'or the habitations in which bees live, breed, and work, have been made of different materials, and in different forms, according to the fancy of people of different ages and countries. Melissus, king of Crete, is said to have been the first who invented and taught the use of bee-hives. Not only straw, which experience now proves to be rather preferable to every thing else, but wood, horn, glass, &c. have been used for the construction of hives. Single box hives, however, when properly made, answer very well, and, when painted, last long. They have several advantages above straw hives: they are quite cleanly and always stand upright; they are proof against mice; and are cheaper in the end than straw hives; for one box will last as long as three of them. I have known many bee-masters who never used any other kind of hives, and whose bees thrived very well. I believe, however, they are rather colder in winter, but a proper covering will prevent all danger from that quarter. But straw hives are easiest obtained at first, and have been used and recommended by the most of bee-masters. As to the size, a hive that will hold about 2½ pecks, Linlithgow measure, will hold a pretty large swarm; but there is no certain rule to judge what hive will be exactly filled by a swarm. Much depends upon the succeeding season. If the swarm be early and large, it will require a large hive; but if otherwise, the hive should be proportionably less. If a swarm be put into one of the size above mentioned, and the bees fill it soon, and appear to want more room, it can easily be enlarged, by putting an eek below it: but if it be heavy enough for a stock hive, it will do, although it should not be quite full of combs. A straw hive, when made, should have a piece of wood fixed in the undermost roll, four inches long, with a notch cut out of it, three inches long, and one high, for an entry to the bees. The straw of rye or wheat is best for making hives. The heads of the straw should be cut off. The rolls should be drawn very tight, and wrought together with small willows or brambles, split and properly dressed, with the pith taken out of them. The hives should be made as smooth as possible, without leaving any projecting straws; which, when not cut or singed away, (as should always be done when the hives are rough) would occasion much unnecessary trouble to the bees, when put into them, to gnaw them off. When the hives are made, and, if necessary, gently singed with straw, four small sticks should be fixed across the inside of them, at proper distances, in order not only to keep the hive firm, but also to prevent the combs from falling down, (which they would otherwise do by their own weight,) or from being shifted out of their places, when the hives are rapped upon, or disturbed accidentally.' Mr. Bonner next describes Colony Hives, which, however, he does not much approve of, and says, 'they have never yet been, and he is persuaded never will be, extended to general use, although it is nearly two centuries since they were first invented by John Geddie, Esq.' He admits, however, that they have 'one advantage as they afford an opportunity to the inquisitive philosopher of seeing the bees carry on their labor.' Messrs. Thorley and White, by their improvements of them, have obtained the additional advantage of saving the lives

of their bees. To these directions we shall add those of the celebrated Mr. Wildman, as they differ from Mr. Bonner's in several particulars: 'My hives,' says he, 'are seven inches in height and ten in width. The sides are upright, so that the top and bottom are of the same diameter. A hive holds nearly a peck. In the upper row of straw there is a hoop of about half an inch in breadth; to which are nailed five bars of deal, full a quarter of an inch in thickness, an inch and a quarter wide, and half an inch asunder from one another: a narrow short bar is nailed at each side, half an inch distant from the bars next them, to fill up the remaining parts of the circle; so that there are in all seven bars of deal to which the bees fix their combs. The space of half an inch between the bars allows a sufficient and easy passage for the bees from one comb to another. To give great steadiness to the combs, so that upon moving the hive they may not fall off, or incline out of their direction, a stick should be run through the middle of the hive, in a direction directly across the bars, or at right angles with them. When the hives are made, a piece of wood should be worked into the lower row of straw, long enough to allow a door for the bees of four inches in length, and half an inch in height. The proprietor of the bees should provide himself with several flat covers of straw worked of the same thickness as the hives, and a foot in diameter, that so it may be of the same width as the outside of the hives. Before the cover is applied to the hive a piece of clean paper, of the size of the top of the hive, should be laid over it; and a coat of cow-dung, which is the least apt to crack of any cement easily obtained, should be laid all round the circumference of the hive. Let the cover be laid upon this, and made fast to the hive with a packing-needle and pack-thread, so that neither cold nor vermin may enter. Each hive should stand single on a piece of deal or other wood, somewhat larger than the bottom of the hive. That part of the stand which is at the mouth of the hive should project some inches, for the bees to rest on when they return from the field. This stand should be supported upon a single post, two feet and a half high, to which it should be screwed very securely, that high winds, or other accidents, may not blow down both stand and hive. A quantity of soot mixed with barley chaff should be strewed on the ground round the post; which will effectually prevent ants, slugs, and other vermin, from rising up to the hive. The soot and chaff should from time to time be renewed as it is blown or washed away; though, as it is sheltered by the stand, it remains a considerable time, especially if care be taken that no weeds rise through it. Weeds, indeed, should not be permitted to rise near the hive: for they may give shelter to vermin which may be hurtful to the bees. The stands for bees should be four yards asunder; or, if the apiary will not admit of so much, as far asunder as may be, that the bees of one hive may not interfere with those of another hive, as is sometimes the case when hives are near one another, or on the same stand; for the bees, mistaking their own hives, light sometimes at the wrong door, and a fray ensues, in which one or more may lose their lives.'

On the purchasing of hives. 'Any person,' says Mr. Bonner, 'who intends to erect an apiary, must take particular care to have it filled with proper inhabitants. He must be peculiarly attentive to this, as all his future profit and pleasure, or loss and vexation, will in general depend upon it. He must therefore pay the utmost attention to the choice of his stock hives; for the man who takes care to keep good stock hives will soon gain considerably by them; but he who keeps bad ones, will, besides a great deal of trouble, and little or no success, soon become a broken bee-master. In September every stock hive ought to contain as much honey as will supply the bees with food till June following; and as many bees as will preserve heat in the hive, and thereby resist the severity of a cold winter, and act as so many valiant soldiers, to defend the community from the invasion of foreign enemies in spring. Therefore the bee-master should purchase a proper number of hives in August or September, when they are at the cheapest rate. They should be full of combs, and well stored with bees and honey; and should weigh at least thirty pounds each; if heavier, so much the better; for light hives run a great risk of perishing by famine, unless the bees are supplied with food; which will cost as much expense, and a great deal more trouble, besides a considerable risk of their dying at last, after all this extraordinary trouble and expense. Whereas, a well-chosen hive of thirty pounds weight, allowing twelve pounds for the empty hive, bees, combs, &c., will contain eighteen pounds of honey, which will supply the bees with food till next June; a time, when it may be presumed, they will find abundance of provisions for themselves among the flowers. When a choice can be obtained, the youngest hive should always be preferred, because old hives are liable to vermin, and other accidents. But although a hive should be four or five years old, it should not be rejected if it possesses these two essential qualities — plenty of bees, and abundance of honey; but, if either of these be wanting, the purchaser will regret his bargain when it is too late.' And Mr. Wildman advises that 'the purchaser should examine the combs, in order to know the age of the hives. The combs of that season are white, those of the former year are of a darkish yellow; and where the combs are black the hives should be always rejected. If the number of hives wanted were not purchased in autumn, it will be necessary to remedy this neglect after the severity of the cold is past in the spring. At this season, bees which are in good condition will get into the fields early in the morning, return loaded, enter boldly, and not come out of the hive in bad weather; for if they do this it shows they are in great want of food. By the loudness of their humming we judge of their strength. The summer is an improper time for buying bees, because the heat of the weather softens the wax, and renders the combs liable to break, if they are not very well secured. The honey, too, being then thinner, is more apt to run out of the cells, which is attended with a double disadvantage; namely, the loss of the

honey and the daubing of the bees, whereby many of them may be destroyed. A first and strong swarm may indeed be purchased; and, if leave can be obtained, permitted to stand in the same garden till autumn; but, if leave is not obtained, it may be carried away in the night after it has been hived.'

Bees, as has been observed, never swarm till the hive be too much crowded by the young brood. They first swarm in May, or in the end of April, but earlier or later according to the warmth of the season. They seldom swarm before ten in the morning, and seldom later than three in the afternoon. We may know when they are about to swarm by clusters of them *hanging* on the outside of the hive, and by the drones appearing abroad more than usual: but the most certain sign is when the bees refrain from going into the fields though the season be inviting. Just before they take flight there is an uncommon silence in the hive; after this, as soon as one takes flight, they all follow. Before the subsequent swarmings, there is a great noise in the hive, which is supposed to be occasioned by a contest, whether the young or the old queen should go out. When the bees of a swarm fly *high*, they will descend lower, upon throwing handfuls of sand or dust among them, which they probably mistake for rain. For the same purpose it is usual to beat upon a kettle or frying-pan. This practice may have taken its rise from observing that thunder or any great noise prompts bees in the fields to return home. As soon as the swarm is settled the bees which compose it should be got into a hive with all convenient speed to prevent their taking wing again. If they settle on a small branch of a tree easy to come at, it may be cut of and laid upon a cloth, the hive being ready immediately to put over them. If the branch cannot be conveniently cut, the bees may be swept from off it into the hive. Lodge but the queen into the hive and the rest will soon follow. If the bees must be considerably disturbed in order to get them into a hive, the most advisable way is to let them remain in the place where they have pitched till the evening, when there is less danger of their taking wing. If it be observed that they still hover about the tree they first lighted upon, the branches may be rubbed with rue, elder-leaves, or any other thing distasteful to them, to prevent their returning to it. The hive employed on this occasion should be cleaned with the utmost care, and its inside rubbed with fragrant herbs or flowers, the smell of which is agreeable to the bees, or with honey. The hive should not be immediately set on the stool where it is to remain, but kept near the place at which the bees settled till the evening, lest some stragglers should be lost. It should be shaded either with boughs or with cloth, that the too great heat of the sun may not annoy the bees. We sometimes see a swarm of bees, after having left their hive, and even alighted upon a tree, return to their first abode. This never happens but when the young queen did not come forth with them, for want of strength, or perhaps courage to trust to her wings for the first time; or possibly from a consciousness of her not being impregnated.

When a swarm is too few in number for a hive, another may be added or united to it. The usual method of thus uniting swarms is very easy. Spread a cloth at night upon the ground close to the hive in which the two casts or swarms are to be united; lay a stick across this cloth; then fetch the hive with the new swarm, set it over the stick, give a smart stroke on the top of the hive, and all the bees will drop down on the cloth in a cluster. This done, throw aside the empty hive, take the other from off the stool, and set this last over the bees, who will soon ascend into it, mix with those already there, and become one and the same family. Others, instead of striking the bees down upon the cloth, place, with its bottom upmost, the hive in which the united swarms are to live, and strike the bees of the other hive down into it. The former of these hives is then restored to its natural situation, and the bees of both hives soon unite. If some bees still adhere to the other hive they may be brushed off on the cloth, and they will soon join their brethren. Or one may take the following method, which gives the less disturbance to the bees: set with its mouth upmost the hive into which the young swarm has been put, and set upon it the other hive. The bees in the lower hive, finding themselves in an inverted situation, will soon ascend into the upper. Though all writers acknowledge, that one of the queens is constantly slain on these occasions, and generally a considerable number of the working bees; yet none of them, Columella excepted, has proposed the easy method of killing the queen of the latter cast or swarm before the union is made; a means by which the lives of the working bees may be preserved. This may be done either by intoxicating them and then picking her out, or by searching her out when the bees are beaten down upon the cloth; for this being done in the night, to prevent the battle which may otherwise ensue, there will be no great difficulty in finding her. A large swarm may weigh eight pounds, and so gradually less to one pound; consequently a very good one may weigh five or six pounds. All such as weigh less than four pounds should be strengthened, by uniting to them a less numerous swarm. The size of the hive should be proportioned to the number of the bees; and, as a general rule, it should be rather under than over sized, because bees require to be kept warmer than a large hive will admit.

Respecting methods of changing the situations of bees, great improvements may certainly be made in the essential article of providing them plenty of pasture. A rich corn country is a barren desert for them during a great part of the year; and therefore the practice of other nations in changing the situation of their bees, well deserves our imitation. Columella informs us, lib. ix. c. 14., that as few places are so happily situated as to afford the bees proper pasture both in the beginning of the season and in the autumn, Celsus advised that, after the vernal pastures are consumed, the bees should be transported to places abounding with autumnal flowers, as was practised by conveying the bees from Achaia to Attica, from Eubœa and the Cyclades to Scyrus; and also in Sicily, where they were brought to Hybla from

other parts of the island. We find by Pliny that this was likewise the practice of the Italians in his time. 'As soon,' says he, 'as the spring food for bees has failed in the valleys near our towns, the hives of bees are put into boats, and carried up against the stream of the river, in the night, in search of better pasture. The bees go out in the morning in quest of provisions, and return regularly to their hives in the boats, with the stores they have collected. This method is continued till the sinking of the boats to a certain depth in the water shows that the hives are sufficiently full; and they are then carried back to their former homes, where their honey is taken out of them.' This is still the practice of the Italians, who live near the banks of the Po, the river which Pliny instanced particularly in the above-quoted passage, lib. xxi. c. 12. M. Maillet relates, in his curious Description of Egypt, vol. ii. p. 24., that in spite of the ignorance and rusticity which have got possession of that country, there yet remain in it several footsteps of the industry and skill of the ancient Egyptians. One of their most admirable contrivances is, their sending their bees annually into distant countries, to procure sustenance, at a time when they could not find any at home; and their afterwards bringing them back like shepherds who should travel with their flocks and make them feed as they go. It was observed by the ancient inhabitants of Lower Egypt, that all plants blossomed, and the fruits of the earth ripened, about six weeks earlier in Upper Egypt than with them. They applied this remark to their bees; and the means then made use of by them, to enable these usefully industrious insects to reap advantage from the more forward state of nature there, were exactly the same as are now practised, for the like purpose, in that country. About the end of October, all such inhabitants of the Lower Egypt as have hives of bees embark them on the Nile, and convey them up that river quite into Upper Egypt; observing to time it so, that they arrive there just when the inundation is withdrawn, the lands have been sown, and the flowers begin to bud. The hives thus sent are marked and numbered by their respective owners, and placed pyramidically in boats prepared for the purpose. After they have remained some days at their farthest station, and are supposed to have gathered all the wax and honey they could find in the fields, within two or three leagues around, their conductors convey them in the same boats two or three leagues lower down, and there leave the laborious insects so long as is necessary for them to collect all the riches of that spot. Thus the nearer they come to the place of their more permanent abode, they find the productions of the earth, and the plants which afford them food, forward in proportion. In fine, about the beginning of February, after having travelled through the whole length of Egypt, gathering all the rich produce of the delightful banks of the Nile, they arrive at the mouth of that river, towards the ocean; from whence they set out, and from whence they are now returned to their several homes; for care is taken to keep an exact register of every district, from whence the hives were sent in the beginning of the season; of their numbers, of the names of the persons who sent them, and likewise the mark or number of the boat in which they were placed.' In many parts of France, floating bee-houses are very common. They have on board one barge sixty or a hundred bee-hives, well defended from the inclemency of an accidental storm. With these the owners suffer themselves to float gently down the river, the bees continually choosing their flowery pasture along the banks of the stream; and thus a single floating bee-house yields the proprietor a considerable income. They have also a method of transporting their bees by land, well worth our imitation in many parts of this kingdom. Their first care is, to examine those hives, some of whose honeycombs might be broken or separated by the jolting of the vehicle; these are made fast one to the other, and against the sides of the hive, by means of small sticks, which may be disposed differently as occasion will point out. This being done, every hive is set upon a packing-cloth, or something like it, the threads of which are very wide; the sides of this cloth are then turned up and laid on the outside of each hive. As many hives as a cart built for that purpose will hold, are afterwards placed in this vehicle. The hives are set two and two, the whole length of the cart. Over these are placed others; which make, as it were, a second story or bed of hives. Those which are stored with combs should always be turned topsy-turvy. It is for the sake of their combs, and to fix them the better, that they are disposed in this manner; for such as have but a small quantity of combs in them, are placed in their natural situation. Care is taken in the stowage not to let one hive stop up another, it being essentially necessary for the bees to have air; and it is for this reason that they are wrapped up in a coarse cloth, the threads of which were wove very wide, that the air may have a free passage, and lessen the heat which these insects raise in their hives, especially when they move about very tumultuously, as often happen in these carts. Those used for this purpose in Yevre, hold from thirty to forty hives. As soon as all are thus stowed, the caravans set out. If the season is sultry, they travel only in the night but a proper advantage is made of cool days. These caravans do not go fast. The horses must not be permitted even to trot: they are led slowly and through the smoothest roads. When there are not combs in the hives sufficient to support the bees during their journey, the owner takes the earliest opportunity of resting them wherever they can collect wax. The hives are taken out of the cart, then set upon the ground and after removing the cloth from over them, the bees go forth in search of food. The first field they come to serves them as an inn. In the evening, as soon as they are all returned, the hives are shut up; and being placed again in the cart, they proceed on their journey. When the caravan is arrived at the journey's end, the hives are distributed in the gardens, or in the fields adjacent to the houses of different peasants who, for a very small reward, undertake to look after them. Thus it is that, in such spots as do not abound in flowers at all seasons, means are found to supply the bees with food during the

whole year. These instances of the great advantages which attend the shifting of bees in search of pasture afford an excellent lesson to many places in this kingdom: they direct particularly the inhabitants of the rich vales, where the harvest for bees ends early, to remove their stocks to places which abound in heath; this plant continuing in bloom during a considerable part of autumn, and yielding great plenty of food to bees. Those also in the neighbourhood of hills and mountains will save the bees a great deal of labor by shifting their places of abode. Mr. Bonner, who has had long practice in this branch of bee husbandry, advises, 'when the distance is great, and there is a considerable number of hives to be transported, (perhaps to the distance of six, twelve, twenty, or fifty miles,) into an inland country, carriages that move on springs are by all means to be preferred. When these cannot be obtained, the hives may easily be carried on carts or wagons, in cold weather, by placing them with their bottoms upmost on large quantities of straw, hay, or any other soft article. By this method I have carried twenty hives at one time, with very little damage, either to the bees or the combs.' Mr. Bonner recommends 'the utmost care, that no opening be left for the bees to get out at; as they would be rendered so irritable by the jolting of the carriage, that they might, by stinging the horses, endanger the lives of both horses and driver. And to prevent such risk he particularly recommends water carriage, wherever it can be obtained, by sea, lakes, canals, or rivers;' and adds, that, 'in winter, 1764-5, he carried twenty hives on ship board 5000 miles;' and that he would rather carry bee-hives 400 miles by sea, than 100 by land.'

The methods of feeding bees are various.—Providence has ordained that insects which feed on leaves, flowers, and green succulent plants, are in an insensible or torpid state, from the time that the winter's cold has deprived them of the means of subsistence. Thus the bees during the winter are in so lethargic a state that little food supports them; but as the weather is very changeable, and every warm or sunny day revives them and prompts them to return to exercise, food becomes necessary on these occasions. Many hives of bees which are thought to die of cold in winter in truth die of famine: when a rainy summer has hindered the bees from laying in a sufficient store of provisions. The hives should therefore be carefully examined in autumn, and should then weigh at least eighteen pounds. Columella describes an annual distemper which seizes bees in the spring when the spurge blossoms and the elm discloses its seeds; for being allured by the first flowers, they feed so greedily upon them that they surfeit themselves, and die of a looseness if they are not speedily relieved. The authors of the Maison Rustique impute this purging to the bees feeding on pure honey, which does not form a food sufficiently substantial for them unless they have bee-bread to eat at the same time; and advise giving them a honey-comb taken from another hive, the cells of which are filled with crude wax or bee-bread. There is still, however, a want of experiments to ascertain both the time and the manner in which bees should be fed. The common practice is to feed them in autumn, giving them as much honey as will bring the whole weight of the hive to near twenty pounds. To this end the honey is diluted with water, and then put into an empty comb, split reeds, or, as Columella directs, upon clean wood, which the bees will suck perfectly dry. But the dilution with water makes the honey apt to candy, and candied honey is prejudicial to bees. The following directions, given in the Maison Rustique, (tom. i. p. 435.) seem to be very judicious. Replenish the weak hives in September with such a portion of combs full of honey, taken from other hives, as shall be judged to be a sufficient supply for them. In order to do this turn up the weak hive, cut out the empty combs, and put the full ones in their place, where secure them with pieces of wood run across in such a manner that they may not fall down when the hive is returned to its place. The bees will soon fix them more effectually. If this method be thought too troublesome, set under the hive a plate of liquid honey, unmixed with water, with straws laid across it, and over these a paper pierced full of holes, through which the bees will suck the honey without daubing themselves. This should be done in cloudy or rainy weather, when the bees stir least abroad; and the hive should be covered to protect the bees from robbers who might be allured to it by the smell of the honey. Another circumstance which may render it very necessary to feed the bees is, when several days of bad weather ensue immediately after they have swarmed; for then, being destitute of every supply beyond what they carried with them, they may be in great danger of starving. In this case honey should be given them in proportion to the duration of the bad weather. The degree of cold which bees can endure has not been ascertained. We find that they live in the cold parts of Russia, and often in hollow trees, without any care being taken of them. Their hives are frequently made of the bark of trees which does not afford them much protection from cold. Mr. White, therefore, judiciously observes, that bees which stand on the north side of a building, whose height intercepts the sun-beams all the winter, will waste less of their provisions (almost by half) than others which stand in the sun; for coming seldom forth they eat little; and yet in the spring are as forward to work, and swarm, as those which had twice as much honey in the autumn before. The owner should, however, examine their state in winter; and if he finds that instead of being clustered between the combs, they fall down in numbers on the bottom of the hive, the hive should be carried to a warmer place, where they will soon recover. He must be cautious in returning them again to the cold lest the honey should candy. When the winters are extremely severe, the authors of the Maison Rustique advised to lay on the bottom of an old cask the depth of half a foot of very dry earth, powdered and pressed down hard, and to set on this the stool with the hive: then to preserve a communication with the air, which is absolutely necessary, to cut a hole in the cask opposite to the

mouth of the hive, and place a piece of reed or alder made hollow, from the mouth of the hive to the hole in the cask; and after this to cover the hive with more of the same dry earth. If there be any reason to fear that the bees will not have a sufficiency of food, a plate with honey, covered as before directed, may be put under the hive. If the number of hives be great, boxes may be made of deals nailed together deep enough to contain the hives when covered with dry earth. The bees will thus remain all the winter free from any danger from cold, hunger, or enemies. Mr. Bonner allots three whole chapters of his new plan to this part of our subject for which we must refer the reader to his work.

The method of taking the honey and wax from bees, in this country, is usually accompanied with robbing them also of their lives. The common method is, that when those which are doomed for slaughter have been marked out, (which is generally done in September,) a hole is dug near the hive, and a stick, at the end of which is a rag that has been dipped in melted brimstone, being stuck in the hole, the rag is set on fire, the hive is immediately set over it, and the earth is instantly thrown up all around, so that none of the smoke can escape. In a quarter of an hour all the bees are seemingly dead; and they are rendered soon after irrecoverably so, by being buried in the earth that is returned back into the hole. By this last means it is that they are absolutely killed; for it has been found, by experiment, that all the bees which have been affected only by the fume of the brimstone recover again, excepting such as have been singed or hurt by the flame. Hence it is evident that the fume of brimstone might be used for intoxicating the bees, with some few precautions. The heaviest and the lightest hives are alike treated in this manner; the former, because they yield the most profit with an immediate return; and the latter, because they would not survive the severity of the winter. Those hives which weigh from fifteen to twenty pounds are thought to be the fittest for keeping. More humane and judicious methods were practised by the ancients; (See Columella lib. ix. c. 15. and Varro de Rustica, lib. iii. c. 16.) and the following simple method is at this day practised in Greece, degenerated as it is. Mr. Wheeler, in his Journey into Greece, p. 411, tells us that 'Mount Hymethus is celebrated for the best honey in all Greece. This mountain was not less famous in times past for bees and admirable honey; the ancients believing that bees were first bred here, and that all other bees were but colonies from this mountain; which if so, we assured ourselves that it must be from this part of the mountain that the colonies were sent; both because the honey made here is the best, and that here they never destroy the bees. It is of a good consistence, of a gold color, and the same quantity sweetens more water than the like quantity of any other doth. I no sooner knew that they never destroy or impair the stock of bees, in taking away their honey, but I was inquisitive to understand their method of ordering the bees; which, being an art so worthy the knowledge of the curious, I shall not think it irrelevant to relate what I saw, and was informed of, to that effect, by such as had skill in that place. The hives in which they keep their bees are made of willows or osiers, fashioned like our common dust-baskets, wide at top and narrow at the bottom, and plastered with clay or loam within and without. They are set as in plate I. APIS. fig. 22., with the wide end uppermost. The tops are covered with broad flat sticks, which are also plastered over with clay; and to secure them from the weather they cover them with a tuft of straw as we do. Along each of these sticks the bees fasten their combs; so that a comb may be taken out whole without the least bruising, and with the greatest ease imaginable. To increase them in spring time, that is in March or April until the beginning of May, they divide them; first separating the sticks, on which the combs and bees are fastened, from one another with a knife; so taking out the first comb and bees together on each side, they put them into another basket, in the same order as they were taken out, until they have equally divided them. After this, when they are both again accommodated with sticks and plaster, they set the new basket in the place of the old one, and the old one in some new place. And all this they do in the middle of the day, at such time as the greatest part of the bees are abroad; who at their coming home, without much difficulty, by this means divide themselves equally. This device hinders them from swarming and flying away. In August they take out their honey. This they do in the day-time also, while they are abroad; the bees being thereby, say they, disturbed least: at which time they take out the combs laden with honey, as before; that is, beginning at each outside, and so taking away till they have left only such a quantity of comb in the middle as they judge will be sufficient to maintain the bees in winter; sweeping those bees that are on the combs into the basket again, and then covering it with new sticks and plaster. The Greek method above related was introduced into France in 1754, as we are informed by M. De Reaumur and Du Hamel, in the Memoirs of the Royal Academy for that year, p. 331. In our own country Mr. Bonner has long saved the lives of his bees; and throughout his New Plan repeatedly reproaches the barbarous practice of murdering them. Various methods have also been adopted in England to attain the desirable end of getting the honey and wax without destroying the bees; the most approved of which we shall now describe as concisely as possible.

Mr. Thorley, in his Enquiry into the Nature Order, and Government of Bees, thinks colonies preferable to hives, for the following reasons: first, the more certain preservation of very many thousands of these useful creatures; secondly, their greater strength, which consists in numbers, and consequently their greater safety from robbers; thirdly, their greater wealth arising from the united labors of the greater number. He tells us that he has in some summers taken two boxes filled with honey from one colony; and yet sufficient store has been left for their maintenance during the winter; each

box weighing forty pounds. Add to these advantages the pleasure of viewing them, with the greatest safety, at all seasons, even in their busiest time of gathering, and their requiring a much less attendance in swarming time. The bees thus managed are also more effectually secured from wet and cold, from mice and other vermin. His boxes are made of deal, which, being spongy, suck up the breath of the bees sooner than a more solid wood would do. Yellow dram deal thoroughly seasoned is the best. An octagon, being nearer to a sphere, is better than a square form; for as the bees, in winter, lie in a round body near the centre of the hive, a due heat is then conveyed to all the out parts, and the honey is kept from candying. The dimensions which Mr. Thorley, after many years' experience, recommends for the boxes, are ten inches deep, and twelve or fourteen inches breadth in the inside. He tried boxes containing a bushel or more, but found they did not answer the design like those of a lesser size. The larger are much longer in filling, so that it is the latter ere one can reap the fruits of the labor of the bees; nor is the honey so good and fine, the effluvia even of their own bodies tainting it. The best and purest honey is that which is gathered in the first five or six weeks: and in boxes of less dimensions one may take within a month, provided the weather be favorable a box full of the finest honey. The top of the box should be made of an entire board, a full inch thick after it has been planed; and it should project on all sides, at least an inch beyond the dimensions of the box. In the middle of this top there must be a hole five inches square, for a communication between the boxes; this hole should be covered with a sliding shutter, of deal or elm, running chiefly in a groove over the back window. The eight pannels, nine inches deep, and ¾ of an inch thick when planed, are to be let into the top so far as to keep them in their proper places; to be secured at the corners with plates of brass, and to be cramped with wires at the bottom to keep them firm; for the heat in summer will try their strength. There should be a glass window behind, fixed in a frame, with a thin deal cover, two small brass hinges, and a button to fasten it. This window will be sufficient for inspecting the progress of the bees. Two brass handles, one on each side, are necessary to lift up the box; these should be fixed in with two thin plates of iron, near three inches long, so as to turn up and down, and put three inches below the top board, which is nailed fast down with sprigs to the other parts of the box.

Those who choose a frame within, to which the bees may fasten their combs, need only use a couple of deal sticks of an inch square, placed across the box, and supported by two pins of iron; one an inch and a half below the top, and the other two inches below it; by which means the combs will quickly find a rest. One thing more, which perfects the work, is a passage four or five inches long, and less than half an inch deep, for the bees to go in and out at the bottom of the box. In keeping bees in colonies, shade is necessary, or at least a shade; without which the weather, especially the heat of the sun, would soon rend the boxes to pieces. The house may be made of any boards, but deal is the best; and it must be painted, to secure it from the weather. The length of it for six colonies should be full 12½ feet, and each colony should stand a foot distant from the other. It should be 3½ feet high, to admit four boxes one upon another; but, if only three boxes are employed, two feet eight inches will be sufficient. Its breadth in the inside should be two feet. The four corner posts should be made of oak, and well fixed in the ground, that no stormy winds may overturn it; and all the rails should be of oak, supported by several uprights of the same, before and behind, that they may not yield or sink under 600, 700, or 800 weight, or upwards. The floor of the house, about two feet from the ground, should be strong and smooth, that the lowest box may stand close to it. This floor may be made with boards or planks of deal the full length of the bee-house, or, which is preferable, with a board or plank to each colony, of two feet four inches long, and fixed down to the rails; and that part which appears at the front of the house may be cut into a semicircle, as a proper alighting place for the bees. Plane it to a slope, that the wet may fall off. When this floor to a single colony wants to be repaired, it may easily be removed, and another be placed in its room, without disturbing the other colonies, or touching any other part of the floor. Upon this floor, at equal distances, all the colonies must be placed, against a passage cut in the front of the house. To prevent any false step, that as the top board of the box (being a full inch broader than the other part) will not permit the two mouths to come together, cut a third in a piece of deal of a sufficient breadth, and place it between the other two, so close that not a bee may get that way into the house. Fix the said piece of deal to the floor with two lath nails; which will be of service, when there is occasion either to raise a colony, or take a box of honey, and may prove a means of preventing a great deal of trouble and mischief. The house must next be covered with boards, fine slates, or tiles placed so as to carry off the wet, and keep out the cold, rain, snow, or whatever might any way hurt or prejudice them. The back doors may be made of half-inch deal, two of them to shut close in a rabbet cut in an upright pillar; which may be so contrived as to take in and out by a mortise in the bottom rail, and a notch in the inside of the upper rail, and fastened with a strong hasp. Place these pillars in the spaces between the colonies. In a house made after this model, without front doors, a weather board will be very necessary, to carry the water off from the places where the bees settle and rest. Painting will also be a great preservative. Paint the mouths of the colonies with different colors, as red, white, blue, yellow, &c. in form of a half moon, or square, that the different bees may the better know their own homes. Such diversity will be a direction to them. Thus the bees will be kept warm in the coldest winter; and in the hottest summer greatly refreshed by the cool air, the back doors being set open, without any air

holes made in the boxes. Dr. Warder observes, that in June, July, and August, when the colonies come to be very full, and the weather proves very hot, the appearance of a shower drives the bees home in such crowds, that, pressing to get in, they stop the passage so closely, that those within are almost suffocated for want of air; which makes these last so uneasy that they are almost mad. In this extremity he has lifted the whole colony up a little on one side; and by thus giving them air, has soon quieted them. He has known them, he says, come pouring out, on such an occasion, in numbers sufficient to have filled at once two or three quarts; as if they had been going to swarm. To prevent this inconvenience he advises cutting a hole two inches square, about the middle of one of the hinder pannels of each box. Over this hole, nail, in the inside of the box, a piece of tin-plate punched full of holes so small that a bee cannot creep through them; and place over it, on the outside, a very thin slider, made to run in grooves; so that when it is thrust home all may be close and warm; and when it is opened, in very hot weather, the air may pass through the holes, and prevent the suffocating heat. Or holes may be bored in the pannels themselves, in such an emergency, in a colony already settled. Such a thorough passage for the air may be convenient in extreme heat, which is sometimes so great as to make the honey run out of the combs. The Memoirs of the Berne Society, for 1784, record a particular instance of this, that occurred in 1761, when many in Switzerland were obliged to smother their bees, when they saw the honey and wax trickling down, not knowing any other remedy for the losses they daily sustained. Some shaded their hives from the sun, or covered them with cloths wet several times a day, and watered the ground all around.

The best time to plant the colonies, according to this gentleman, is, either in spring with new stocks full of bees, or in summer with swarms. If swarms are used, procure, if possible, two of the same day; hive them either in two boxes, or in a hive and a box; at night place them in the bee-house, one over the other; and with a knife and a little lime and hair, stop close the mouth of the hive or upper box, so that not a bee may be able to go in or out but at the front door. Within a week or ten days the combs will appear in the boxes; but if it be a hive, nothing can be seen till the bees have wrought down into the box. Never plant a colony with a single swarm, as Mr. Thorley says he has seen sometimes done, but with little success. When the second box, or the box under the hive, appears full of bees and combs, it is time to raise the colony. This should be done in the dusk of the evening, and in the following manner: place the empty box, with the sliding shutter drawn back, behind the house, near the colony that is to be raised, and at nearly the height of the floor: then, lifting up the colony as quickly as possible, let the empty box be put in the place where it is to stand, and the colony upon it; and shut up the mouth of the then upper box with lime and hair, as before directed. When, upon looking through the windows in the back of the boxes, the middle box appears full of combs, and a quantity of honey sealed up in it, the lowest box half full of combs, and few bees in the uppermost box, proceed thus: about five o'clock P. M. drive close with a mallet the sliding shutter under the hive or box that is to be taken from the colony. If the combs are new, the shutter may be forced home without a mallet; but be sure it is close, that no bees may ascend into the hive or box to be removed. After this shut close the doors of the house, and leave the bees thus cut off from the rest of their companions for half an hour or more. In this space, having lost their queen, they will fill themselves with honey, and be impatient to be set at liberty. If in this interval, upon examining the box or boxes beneath, all appears to be quiet in them, it is a sign that the queen is there and in safety. Hereupon raise the back part of the hive or box so far, by a piece of wood slipped under it, as to give the prisoners room to come out, and they will return to their fellows: then lifting the box from off the colony, and turning its bottom uppermost, cover it with a cloth all night; and the next morning, when this cloth is removed, the bees that have remained in it will return to the colony. Thus a box of honey is procured, and all the bees are preserved. If the bees do not all come out in this manner, Dr. Warder's method may be followed, especially if it be with a hive; viz. to place the hive with the small end downwards in a pail, peck, or flower pot, so as to make it stand firm; then to take an empty hive, and set it upon the former, and to draw a cloth tight round the joining of the two hives, so that none of the bees may get out; after this, to strike the full hive so smartly as to disturb the bees that are in it, but with such pauses between the strokes as to allow them time to ascend into the empty hive; which must be held fast whilst this is doing, lest it fall off by the shaking of the other. When, by the noise of the bees in the upper hive, it is perceived that they are got into this last, carry it to a cloth spread for this purpose before the colony, with one end fastened to the landing place, and knock them out upon it: they will soon crawl up the cloth, and join their fellows, who will gladly receive them.

The method which Mr. Thorley has pursued with great success for many years, and which he recommends to the public as the most effectual for preserving bees in common hives, is incorporation, or uniting two stocks into one, by the help of a peculiar fume or opiate, which will give them entirely in the bee-master's power, for time to divide and dispose of at pleasure. But as that dominion over them will be of short duration, he must be expeditious in this business. The queen is immediately to be searched for and killed. Hives which have swarmed twice and are consequently reduced in their number are the fittest to be joined together, as this will greatly strengthen and improve them. If a hive is both rich in honey and full of bees, it is best dividing the bees into two parts, and putting them into two boxes instead of one. Examine whether the stock, to which the bees of another

is to be joined, have honey enough to maintain the bees of both: it should weigh full twenty pounds. The narcotic, or stupifying fume, is made with the fungus maximus or pulverulentus, the large mushroom, commonly known by the name of bunt, puck-fist, or frog-cheese. It is as big as a man's head, or bigger, when ripe; it is of a brown color, turns to powder, and is exceeding light. Put one of these pucks into a large paper, press it therein to two-thirds or near half the bulk of its former size, and tie it up very close; then put it into an oven some time after the household bread has been drawn, and let it remain there all night: when it is dry enough to hold fire, it is fit for use. The manner of using it is this: cut off a piece of the puck, as large as a hen's egg, and fix it in the end of a small stick slit for that purpose, and sharpened at the other end, which place so that the puck may hang near the middle of an empty hive. This hive must be set with the mouth upward, in a pail or bucket which should hold it steady, near the stock intended to be taken. This done set fire to the puck, and immediately place the stock of bees over it, tying a cloth round the hives, that no smoke may come forth. In a minute, or little more, the bees will be heard falling like drops of hail into the empty hive. Then beat the top of the full hive gently, to get out as many of them as possible: after this, loosing the cloth, lift the hive off to a table, knock it several times against the table, several more bees will tumble out, and perhaps the queen among them. She often is one of the last that falls. If she is not there, search for her among the main body in the empty hive, spreading them for this purpose on a table. Proceed in the same manner with the other hive, with the bees of which these are to be united. One of the queens being secured, put the bees of both hives together, mingle them thoroughly, and drop them among the combs of the hive which they are intended to inhabit. Then cover it with a coarse cloth, which will admit air, and let them remain shut up all that night and the next day. It will easily be known when they are awaked from this sleep. The second night after their union, in the dusk of the evening, gently remove the cloth from off the mouth of the hive, and the bees will immediately sally forth with a great noise; but, being too late, they will soon return: then inserting two pieces of tobacco-pipes to let in air, keep them confined for three or four days, after which the door may be left open. The best time for uniting bees is after their young brood are all out, and before they begin to lodge in the empty cells. As to the hour of the day, Mr. Thorley advises young practitioners to do it early in the afternoon, in order that, having the longer light, they may the more easily find out the queen. He never knew such combined stocks conquered by robbers.—They will either swarm in the next summer, or yield a hive full of honey.

Mr. N. Thorley, son of the above-mentioned clergyman, has added to the edition which he has given of his father's book, a postscript, purporting, that persons who choose to keep bees in glass hives may, after uncovering the whole at the top of a flat-topped straw hive, place the glass over it so close that no bee can go in or out but at the bottom of the hive. The glass hive must be covered with an empty hive, or with a cloth, that too much light may not prevent the bees from working. As soon as they have filled the straw hive or box, they will begin to work up into the glass hive. He tells us that he himself has had one of these glass hives filled by the bees in thirty days in a fine season; and that it contained 38lbs. of fine honey. When the glass is completely filled, slide a thin plate between it and the hive or box, so as to cover the passage, and in half an hour the glass may be taken off with safety. The few bees that remain in it will readily go to their companions. He has added a glass window to his straw hives, to see what progress bees make; which is of some importance, especially if one hive is to be taken away whilst the season still continues favorable for their collecting of honey: for when the combs are filled with honey the cells are sealed up, and the bees forsake them, and reside mostly in the hive in which their works are chiefly carried on. Observing also that the bees were apt to extend their combs through the passage of communication in the upper hive, whether glass or other, which rendered it necessary to divide the comb when the upper hive was taken away, he now puts in that passage a wire screen, or netting, the meshes of which are large enough for a loaded bee to go easily through them. This prevents the joining of the combs from one box to the other, and consequently prevents the necessity of cutting them, and of spilling some of the honey, which, running down among a crowd of bees, used to incommode them much, it being difficult for them to clear their wings of it.—Plate I. Apis, fig. 23.

The Rev. Mr. White informs us, that his fondness for these little animals put him upon endeavouring, if possible, to save them from fire and brimstone; that he thought he had reason to be content to share their labors for the present, and great reason to rejoice if he could at any time preserve their lives, to work for him another year; and that the main drift of his observations and experiments has therefore been, to discover an easy and cheap method, suited to the abilities of the common people, of taking away so much honey as can be spared, without destroying or starving the bees; and by the same means to encourage seasonable swarms. In his directions to make the bee-boxes of his inventing, he tells us, speaking of the manner of constructing a single one, that it may be made of deal or any other well-seasoned boards which are not apt to warp or split. The boards should be near an inch thick; the figure of the box square, and its heighth and breadth 9⅝ inches every way measuring within. With these dimensions it will contain nearly a peck and a half. The front part must have a door cut in the middle of the bottom edge, three inches wide, and near half an inch in height, which will give full liberty to the bees to pass through, yet not be large enough for their enemy the mouse to enter. In the back part cut a hole with a rabbet in it, in which fix a pane of the clearest and best crown glass, about five inches

in length, and three in breadth, and fasten it with putty: let the top of the glass be placed as high as the roof within, that the upper part of the combs, where the bees with their riches are mostly placed, may be seen. Thus we can judge of their state and strength, better than if the glass was fixed in the middle. The glass must be covered with a thin piece of wood by way of a shutter, which may be made to hang by a string, or turn upon a nail, or slide sideways between two mouldings. Such as are desirous of seeing more of the bees' works, may make the glass as large as the box will admit without weakening it too much; or they may add a pane of glass on the top, which must likewise be covered with a shutter, fastened down with pegs, to prevent accidents. The side of the box, which is to be joined to another box of the same form and dimensions, as it will not be exposed to the internal air, may be made of a piece of slit deal not half an inch thick. This he calls the side of communication; because it is not be wholly enclosed: a space is to be left at the bottom the whole breadth of the box, and a little more than an inch in height; and a passage is to be made at the top, three inches long, and more than half an inch wide. Through these the bees are to have a communication from one box to the other. The lower communication being on the floor, our laborers, with their burdens, may readily and easily ascend into either of the boxes. The upper communication is also intended as a passage between the boxes, resembling the little holes or narrow passes, which may be observed in the combs formed by our sagacious architects, to save time and shorten the way, when they have occasion to pass from one comb to another; just as in populous cities there are narrow lanes and alleys passing transversely from one large street to another. Next provide a loose board, half an inch thick, and large enough to cover the side where the communications are made. Then have in readiness several iron staples, an inch and a half long, with the two points or ends bended down more than half an inch. Next fix two sticks crossing the box from side to side, and crossing each other, to be a stay to the combs; one about three inches from the bottom, and the other the same distance from the top; and when the whole is painted to make it more durable, the box is finished. The judicious bee-master will here observe, that the form of the box now described is as plain as possible for it to be. It is little more than five square pieces of board nailed together; so that a poor cottager who has but ingenuity enough to saw a board into the given dimensions, and to drive a nail, may make his own boxes well enough, without the help or expense of a carpenter. No directions are necessary for making the other box, which must be of the same form and dimensions. The two boxes differ from each other only in this, that the side of communication of the one must be on the right hand; that of the other on the left. Fig. 24. plate I. APIS, represents two of these boxes, with their openings of communication, ready to join each other.

Mr. White's method of hiving into boxes, &c. is: Take the loose board, and fasten it on one of the boxes, so as to stop the communications. This may be done by three of the staples mentioned; one on the top of the box near the front; the two others on the back, near the top and near the bottom. Let one end of the staple be thrust into a gimlet-hole made in the box, so that the other end may go as tight as can be over the loose board, to keep it from slipping when it is handled. The next morning, after the bees have been hived in this box, the other box should be added, and the loose board should be taken away. This will prevent a great deal of labor to the bees, and some to the proprietor. Be careful to fasten the shutter so close to the glass, that no light may enter through it; for the bees seem to look upon such light as a hole or breach in their house, and on that account may not so well like their new habitation. But the principal thing to be observed at this time is, to cover the box as soon as the bees are hived with a linen cloth thrown closely over it, or with green boughs to protect it from the piercing heat of the sun. Boxes will admit the heat much sooner than straw hives; but if the bees find their heat too great for them, they will leave it. If the swarm be larger than usual, instead of fastening the loose board to one box, join two boxes together with three staples, leaving the communication open from one to the other, and then hive the bees into both. In all other respects they are to be hived into boxes in the same manner as into common hives. The door of the second box should be carefully stopped up, and kept constantly closed, that the bees may not have an entrance but through the first box. When the boxes are set in the places where they are to remain, they must be screened from the summer's sun, because the wood will otherwise be heated to a greater degree than either the bees or their works can bear; and they should likewise be screened from the winter's sun, because the warmth of this will draw the bees from that lethargic state which is natural to them, as well as many other insects in the winter season. For this purpose, and also to shelter the boxes from rain, our ingenious clergyman has contrived the following frame: Fig. 25 represents the front of a frame for twelve colonies, *a a* are two cells of oak lying flat on the ground, more than four feet long. In these cells are fixed four oaken posts about the thickness of such as are used for drying linen. The two posts *b b* in the front, are above two feet six inches above the cells; the other two standing backward, five feet eight inches. Next nail some boards of slit deal horizontally, from one of the fore posts to the other, to screen the bees from the sun. Let these boards be seven feet seven inches in length, and nailed to the side of the posts; and be well seasoned, that they may not shrink or gape in the joints. *c c* are two splints of deal, to keep the boards even and strengthen them. Fig. 26 represents the back of the frame. *d d d d* are strong boards of the same length with the frame, on which plant the boxes. Let the upper side of them be smooth and even, that the boxes may stand true upon them or it may be still more advisable; to plane under every pair of boxes a smooth thin board, as long as the boxes, and about a quarter of an inch wider. The bees will soon fasten the boxes

this board in such a manner that the boxes and board may be moved or weighed together, without breaking the wax or resin, which for many reasons ought to be avoided. These floors must be supported by pieces of wood nailed from post to post at each end. They should also be well nailed to the frame, to keep them from sinking with the weight of the boxes. *f* represents the roof, which projects backward about seven or eight inches beyond the boxes, to shelter them from rain. Next cut niches or holes in the frame, over against each mouth or entrance into the boxes, at *h h h*, fig. 25. Let these niches be nearly four inches long; and under each nail a small piece of wood for the bees to alight upon. The morning or evening sun will shine upon one or both ends of the frame, let its aspect be what it will; but it may be prevented from overheating the boxes by a loose board set up between the posts, and kept in by two or three pegs.

Mr. White, with great humanity, observes, that no true lover of bees ever lighted the fatal match without much concern; and that it is evidently more to our advantage to spare the lives of our bees, and be content with part of their stores, than to kill and take possession of the whole. Mr. Bonner repeatedly expresses the same humane sentiment throughout his work, and earnestly recommends never to kill a single working bee. Mr. White's plan for saving their lives is this: About the end of August, by a little inspection through the glasses, we may easily discover which of the colonies may be laid under contribution. Such as have filled a box and a half, with their works, will pretty readily yield the half box. But we must not depend upon the quantity of combs without examining how they are stored with honey. The bees should have eight or nine pounds left them by way of wages for their summer's work. The most proper time for this business is the middle of the day; and no armor is needed, except a pair of gloves. The operation is very simple, and easily performed thus: Open the mouth of the box intended to be taken; then with a thin knife cut through the resin, with which the bees have joined the boxes to each other, till they are separated; after which, thrust a sheet of tin gently in between the boxes. The communication being hereby stopped, the bees in the fullest box, where it is most likely the queen is, will be a little disturbed at the operation; but those in the other box, where the queen is not, will run to and fro in the utmost hurry and confusion, and send forth a mournful cry, easily distinguished from their other notes. They will issue out at the newly-opened door; not in a body as when they swarm, nor with such calm and cheerful activity as when they go forth to their labors; but by one or two at a time, with a wild flutter and visible rage and disorder. This, however, is soon over; for as soon as they get abroad and join their fellows, they fly to them instantly and join them at the mouth of the other box. By this means, in an hour or two, (for they go out slowly,) a box of pure honey will be got, without having a bee in it; and likewise without dead bees, which, in burning them, are often mixed with the honey, and both waste and damage it. Mr. White acknowledges that he has sometimes found this method fail, when the mouth of the box to be taken away has not been carefully closed: the bees will in this case get acquainted with it as an entrance; and when the mouth is opened, that they may leave this box, many of them will return, and, the communication being stopped, will in a short time carry away all the honey to the other box; so much do they abhor a separation. When this happens he has recourse to the following expedient, which he thinks infallible: he takes a piece of deal, a little larger than will cover the mouth of the box, and cuts in it a square niche, somewhat more than half an inch wide. In this niche he hangs a little trap-door, made of a thin piece of tin, turning upon a pin, with another pin crossing the niche a little lower, so as to prevent the hanging door from opening both ways. This being placed close to the mouth, the bees which want to get out will easily thrust open the door outwards, but cannot open it the other way to get in again; they will therefore readily make to the other box, leaving this in about the space of two hours, with all its stores, justly due to the tender-hearted bee-master as a ransom for their lives. What led Mr. White to prefer collateral boxes to those before in use, was, to use his own words, his compassion for the poor bees, who, after traversing the fields, return home weary and heavy laden, and must perhaps deposit their burden up two pair of stairs, or in the garret. The lower room, it is likely, is not yet furnished with stairs: for, as is well known, our little architects lay the foundations of their structures at the top, and build downward. In this case the weary little laborer has to drag her load up the sides of the walls; and when she has done this, she will travel many times backward and forward, as I have frequently seen, along the roof, before she finds the door or passage into the second story; and here again she is perplexed with a little puzzling labyrinth, before she gets into the third. What a waste is here of that precious time which our bees value so much, and which they employ so well; and what an expense of strength and spirits, on which their support and sustenance depend. In the collateral boxes they are all on the ground floor; and because I know my bees are wise enough to value convenience more than taste, I have made them of such a moderate, though decent height, that the bees have much less way to climb to the top of them, than they have to the crown of a common hive.

We have already alluded to Mr. Wildman's hives. A good swarm will soon fill one of these, and therefore another hive may be put under it the next morning. The larger space allowed the bees, will excite their industry in filling them with combs. The queen will lay some eggs in the upper hive; but so soon as the lower hive is filled with combs, she will lay most of them in it. In little more than three weeks all the eggs laid in the upper hive will be turned into bees; and, if the season is favorable, their cells will be soon filled with honey. As soon as they want room a third hive should be placed under the two former; and in a few days after the end of three weeks from the time the swarm was put

into the hive, the top hive may be taken away at noon in a fair day; and, if any bees remain in it, carry it to a little distance from the stand, and turning its bottom up, and striking it on the sides, the bees will be alarmed, take wing, and join their companions in the second and third hives. If it is found that the bees are very unwilling to quit it, it is probable that the queen remains among them. In this case, the bees must be treated in the manner directed in Mr. Wildman's method of taking the honey and the wax. The upper hive now taken away should be put in a cool place, in which no vermin, mice, &c., can come at the combs, or other damage happen to them, and thus be kept in reserve. When the hives seem to be again crowded, and the upper hive is well stored or filled with honey, a fourth hive should be placed under the third, and the upper hive be taken off the next fair day at noon, and treated as already directed. As the honey made during the summer is the best, and as it is needless to keep many full hives in store, the honey may be taken out of the combs of this second hive for use. If the season is favorable, the bees may still fill a third hive. In this case a fifth hive must be put under the fourth, and the third taken away as before. The bees will then fill the fourth for their winter store. As the honey of the first hive is better than the honey collected so late as that in the third, the honey may be taken out of the combs of the first, and the third may be preserved with the same care as directed for that. In September the top hive should be examined; if full, it will be a sufficient provision for the winter; but, if light, that is, not containing twenty pounds of honey, then, in the month of October, the fifth hive should be taken away, and the hive kept in reserve should be put upon the remaining one, to supply the bees with abundant provision for the winter. Nor needs the owner grudge them this ample store; for they are faithful stewards, and will be proportionally richer and more forward in spring and in summer, when he will reap an abundant profit. The fifth hive should be carefully preserved during winter, that it may be restored to the same stock of bees when an additional hive is wanted next summer; or the first swarm that comes off may be put into it. The combs in it, if kept free from filth and vermin, will save much labor, as they will at once serve the bees for collecting honey. When the hives are changed, a cover, as already directed, should be put upon every upper hive; and when a lower hive becomes an upper hive, the door of it should be shut up, that so their only passage out may be by the lower hive; for otherwise the queen would be apt to lay eggs in both indiscriminately. The whole of the above management of one hive may be extended to any number. It may be proper to keep a register of each set, because in restoring hives to the bees they may be better pleased at receiving their own labors, than those of other stocks. If in autumn the owner has some weak hives, which have neither provision nor numbers sufficient for the winter, it is advisable to join the bees to richer hives; for the greater number of bees will be a mutual advantage to one another during the winter, and accelerate their labors much in the spring. For this purpose carry a poor and a richer hive into a room a little before night; then force the bees out of both hives into two separate empty hives, as directed by Mr. Wildman; shake upon a cloth the bees out of the hive which contains the fewest; search for the queen, and as soon as she is secured with a sufficient retinue, bring the other hive which contains the greater number, and place it on the cloth on which the other bees are, with a support under one side, and with a spoon shovel the bees under it. They will soon ascend, and while under this impression of fear, will unite peaceably with the other bees; whereas, had they been added to the bees of the richer hive, while in possession of their castle, many of the new comers must have paid with their lives for their intrusion.

It appears from the account of the management of bees in Mr. Wildman's hives, that there is very little art wanting to cause the bees to quit the hives which are taken away, unless a queen happens by chance to be among them. In that case, the same means may be used as are necessary when we would rob one of the common hives of part of their wealth. His method is as follows: Remove the hive from which the wax and honey are to be taken into a room; into which admit but little light, that it may appear to the bees as if it were late in the evening. Gently invert the hive, placing it between the frames of a chair or other steady support; and cover it with an empty hive, keeping that side of the empty hive raised a little, which is next the window, to give the bees sufficient light to get into it. While the empty hive is held steadily supported on the edge of the full hive, between your side and your left arm, keep striking with the other hand all round the full hive from top to bottom, in the manner of beating a drum, so that the bees may be frightened by the continued noise from all quarters; and they will in consequence mount out of the full hive into the empty one. Repeat the strokes, rather quick than strong, round the hive, till all the bees are got out of it, which in general will be in about five minutes. The fuller the hive is of bees the sooner they will leave it. As soon as a number of them have got into the empty hive, it should be raised a little from the full one, that the bees may not continue to run from the one to the other, but rather keep ascending upon one another. So soon as all the bees are removed, the hive in which they now are must be placed on the stand from which the other hive was taken, to receive the absent bees as they return from the fields. If this is done early in the season, the operator should examine the royal cells and preserve such of them as have young in them, as well as the combs which have young bees in them, which should on no account be touched, though to preserve them a good deal of honey should also be left behind. Then take out the other combs with a long, broad, and pliable knife, such as the apothecaries use. The combs should be cut from the sides and crown as clean as possible, to save the future labor of the bees, who must lick up the honey spilt, and remove every remains of wax; and then the sides

of the hive should be scraped with a table-spoon, to clean away what was left by the knife. During the whole of this operation, the hive should be placed inclined to the side from which the combs are taken, that the honey which is spilt may not daub the remaining combs. If some combs were unavoidably taken away, in which there are young bees, the parts of the combs in which they are should be returned into the hive, and secured by sticks in the best manner possible. Place the hive then for some time upright, that any remaining honey may drain out. If the combs are built in a direction opposite to the entrance, or at right angles with it, the combs which are farthest from the entrance are to be preferred; because they are best stored with honey, and have the fewest young bees in them. The next business is to return the bees to their old hive; and for this purpose place a table covered with a clean cloth near the stand, and giving the hive in which the bees are a sudden shake, at the same time striking it pretty forcibly, the bees will be shaken on the cloth. Put their own hive over them immediately, raised a little on one side, that the bees may the more easily enter; and when all are entered place it on the stand as before. If the hive in which the bees are, be turned bottom uppermost, and their own hive be placed over it, the bees will immediately ascend into it, especially if the lower hive is struck on the sides to alarm them. As the chief object of the bees during the spring, and beginning of the summer, is the propagation of their kind, honey during that time is not collected in such quantity as afterwards; and on this account it is scarcely worth while to rob a hive before the end of June; nor is it safe to do it after the middle of July, lest rainy weather should prevent them from restoring the combs they have lost, and laying in a stock of honey sufficient for the winter, unless there is a chance of carrying them to a rich pasture.

Hornets and wasps are very formidable enemies of bees, and their nests should be carefully destroyed. Mice should be guarded against, by diminishing the entrance into the hives when the cold comes on, and the bees are less able to defend themselves; and the hives may be placed in such a manner, that it will be impossible for the mice to reach them. Spiders and caterpillars are also very destructive to bees; a species of the latter (called the wax-worm, or wax-moth, because it feeds on wax) lays its eggs in the hive, which turn to maggots that are very noisome and prejudicial. Hives of bees that have swarmed more than once, and such as contain little honey, are most exposed to these insects; for the empty combs serve them for shelter, and the honey supplies them with food. These hives should be cleaned at least once a week; and the stools on which they rest, where the moths are laid by the bees, should be cleaned every morning. But they cannot be entirely destroyed without taking away the infected hive, removing the bees, and cleaning it of the moths, before it is restored to its former occupiers. Bees are often troubled with lice, which may be destroyed by strewing tobacco over them. The depredations of birds, and particularly of the house-lark and swallow, should be carefully prevented. Ants, woodlice, and earwigs are also enumerated by Mr. Bonner among the enemies of the bees. Mr. Keys says, 'The earwigs steal into the hives at night, and drag out bee after bee, sucking out their vitals, and leaving nothing but their skins, like so many scalps or trophies of their butchery.' Mr. Bonner proposes, as 'the best way to extirpate wasps, to destroy their queen or mother in spring, wherever she can be found; for wasps, in this respect, as well as in some other particulars, resemble bees; and therefore, when a mother wasp is killed, a whole nest of them is in effect destroyed. Their nests, however, should also be carefully sought out, and as many of them destroyed as possible, by burning, scalding, or drowning them; lest, like the bees, the wasps should also possess the power of raising a queen-mother from a common egg.' But 'of all the enemies,' says Mr. Bonner, 'the bees have hitherto had to encounter, man may justly be considered as the greatest: for while he follows the old barbarous custom of killing whole hives of that industrious race for the sake of their honey, (a custom which, in many nations, has begun to yield to a more economical, as well as a more humane practice,) he certainly destroys more of these his faithful servants annually, than any other class of animals whatever; or, indeed, than all the other beasts, birds, and insects united, ever did. Nor are those prejudiced murderers of the bees their only enemies among mankind. The predatory class, who steal either their honey or the whole hives, prove equally destructive to them. But it is to be hoped, that as self-interest and humanity equally unite in exploding the practice of the murderers, so the effectual execution of the laws will prove a sufficient protection from the thieves.'

Before entering upon the observations of some later writers on the habits of these interesting creatures, we give a short summary of their physiological peculiarities and structure:

Their organs of nutrition, or those by which they collect and appropriate food, are extremely complex; comprising instruments adapted to the reception of liquid, as well as those fitted for the division of solid aliments. For the former purpose they are provided, in common with all hymenopterous insects, with a long and flexible proboscis or trunk, which may be considered as a lengthened tongue, though, strictly speaking, it is formed by a prolongation of the under lip. It is not tubular, as Swammerdam had supposed, but solid throughout; and the minute depression at its extremity is not the aperture of any canal through which liquids can be absorbed. Cuvier, in his Leçons d'Anatomie Comparée, has not marked this distinguishing feature in the proboscis of the bee, but speaks of it in common with the tubular trunks of the other hymenoptera, and describes its aperture as being situated in the lower part. But Reaumur has very satisfactorily shown that the trunk of the bee performs strictly the office of a tongue, and not that of a tube for suction; for when it takes up honey or other fluid aliment, the under or the upper surfaces are more immediately applied to it, and rolled from side to side, and the bee thus

licks up what adheres to it, while the extremity of the trunk is frequently not applied at all to the substance taken up. The trunk is supported on a pedicle which admits of being bent back, or propelled forwards, and thus can retract or stretch out the trunk to a considerable extent. Protection is given to it by a double sheath; the external consisting of two scales furnished by the expansion of one of the portions of the labial palpi, and the internal, formed by the prolongation of the two external portions of the jaw. The whole member thus consists of five principal parts, on which account Fabricius termed it lingua quinquefida.

For the purpose of dividing solid materials, the *mouth* is furnished with two strong mandibles and four palpi, of great use in enabling the insect to seize and break down hard substances. In the working bee these are of larger dimensions than in the other kinds. The teeth are two in number, and have the form of concave scales with sharp edges; they are fixed to the ends of the jaws, and play horizontally as in other insects. Reaumur describes and delineates a large aperture above the root of the proboscis, which is so surrounded with fleshy parts as not to be readily seen, unless the proboscis be extended and bent downwards. This he considers as the mouth or orifice of the gullet; on the upper side of which, and opposite to the root of the proboscis, a small fleshy and pointed organ is seen, which he regards as the tongue, assisting in the deglutition of the food. Through this orifice, it is presumed, all the aliment, whether liquid or solid, passes; the former being conveyed to it by the trunk, which, by its contractile power, presses forward the fluids it has collected between itself and the inner sheath, and the latter being received directly after its comminution by the teeth, behind which it is situated. Latreille, however, whose authority is great on a point of this nature, thinks that Reaumur has deceived himself with regard to such an aperture, and disbelieves its existence. He conceives that the food simply passes on by the sides of the tongue, finding its way from thence into the œsophagus, and so on to the stomach.

The bee has two *stomachs*: the first a large transparent membranous bag, pointed in front, and swelling out into two pouches behind. It performs an office, in some respects, analogous to that of the crop in birds; for it receives, and retains for a time, the fluid of the nectarea, which does not appear to differ, in any respect, from honey. Mr. Hunter observes, that, whatever time the contents of this reservoir may be retained, he never found them altered, so as to give the idea of digestion having taken place. The coats of this reservoir are muscular, by which means it is capable of throwing up the honey into the mouth, so that it is regurgitated into the honey cells, or imparted to other bees. None of it ever passes out from the extremity of the trunk, as Swammerdam had believed. For the purpose of digestion a second stomach is provided, which takes its origin from the middle of the two posterior lobes of the former, and is of a lengthened cylindrical shape. Its communication with the intestine is not direct, but takes place by a projecting or inverted pylorus, thickest at its most projecting part, with a very small opening in the centre, of a peculiar construction. This inward projecting part is easily seen through the coats of the reservoir, especially if full of honey. A similar kind of structure takes place at the communication of the first with the second stomachs, and, having the properties of a valve, must effectually prevent all regurgitation from the latter into the former.

The physiology of their external senses, though a subject of the long-continued observation of naturalists, is very imperfectly understood. They possess, it is clear, organs appropriated to unknown kinds of impressions, and which must open to them avenues to knowledge of various kinds, to which we must be ever total strangers. Who will compare our thermometers, electroscopes, or hygrometers, however elaborately constructed, with those refined instruments with which the lower classes, and particularly insects, appear to be so liberally provided? The *antennæ*, so universally met with in this class of animals, are doubtless organs of the greatest importance in conveying impressions from without. Their continual motion, the constant use which is made of them in examining objects, the total derangement in the instincts of those insects which have been deprived of them, point them out as exquisite organs of more than one sense. To impressions of touch, arising from the immediate contact of bodies, they are highly sensible; but their motions evidently show that they are affected by distant objects. They are no doubt alive to all the tremulous motions of the air, and probably communicate perceptions of its other qualities. Exceedingly flexible in every direction, they can readily embrace the outline of any body that the bee wishes to examine, however small its diameter, and follow all its movements. It is by means of these instruments that bees are enabled to execute so many works in the interior of the hive, from which the light must be totally excluded; and, aided by them, it builds combs, pours honey into its magazines, feeds the larvæ and ministers to all those wants which it discovers and judges of solely by this species of touch. The antennæ are also the principal means of mutual communication, and constitute a sort of language which appears to be susceptible of a great variety of modifications, and of supplying every species of information. It is in this way they satisfy themselves of the presence of their queen, or communicate the alarming intelligence of her absence. On many occasions the sense residing in the antennæ appears to be supplementary to that of vision, which in bees is less perfect than in many larger animals. During the night, therefore, they are chiefly guided in their movements by this sense. It is singular to observe by moon-light the mode in which bees guard the entrance of the hive against the intrusion of moths which flutter in the neighbourhood. As vigilant sentinels they extend their antennæ at this time to the utmost, moving them alternately to the right and to the left. Woe to the unfortunate moth that comes within their reach. The moths adroitly endeavor to avoid the slightest contact, and to insinuate themselves

between the bees so as to get unperceived into the hive, where they riot upon the honey. In full day-light bees appear to enjoy the sense of vision in great perfection. They will recognise their own habitations from a great distance, and distinguish them at once from many others. On quitting the hive it flies towards the field which is most in flower; and, as soon as it has determined on its course, it takes as direct a line as a ball issuing from a musket. When it has collected sufficient provision it rises in the air to discover its hive, and then darts forward with the velocity of an arrow, and with unerring precision in its aim. Their perceptions of heat and cold, generally referred to the sense of *touch*, appear to be extremely delicate. In several experiments of Huber's, the influence of the rays of the sun excited them to a vigorous action of the wings. It is well known that great cold reduces them to a state of torpor, and inferior degrees of it are evidently unpleasant to them. By their conduct they show that they are sensible of alterations in the weather for some time before we can perceive them. Sometimes, when working with assiduity, they will suddenly desist; none will stir out of the hive, and all the working-bees that are abroad hurry home, and press forward so as to obstruct the entrance of the hive; while we, in the meantime, can distinguish no alteration in the state of the atmosphere. Gathering clouds sometimes produce this effect on them; but perhaps they possess some species of hygrometrical sense, unconnected with any impression of vision. It is said that no bee is ever caught in a sudden shower, unless from some cause it has wandered very far from the hive, or been disabled by accident from returning to it. Huber supposes that it is the rapid diminution of light that alarms them; for if the sky be uniformly overcast they proceed on their excursions, and even the first drops of a soft shower do not make them return with any great precipitation.

Their *taste* is rather singularly the most imperfect of their senses. They exert hardly any discrimination in the collection of honey, being not repelled by the scent or flavor of such as are extremely offensive to our organs, and not scrupling to derive supplies from such as are highly poisonous. The qualities of honey are, indeed, observed to vary much, according to the particular situation from which it is obtained. The most stagnant and putrid waters are resorted to by bees with the same avidity as the purest; and in the selection of flowers they are guided by the quantity of honey they expect to meet with, and in no respect by its quality. When the gardener has cut down all the flowers which before afforded them a plentiful supply, they discontinue their excursions, although the weather be in all respects propitious. Their smell must therefore enable them to discover the presence of honey at great distances. Direct experiment has indeed proved this to be the case. Mr. Huber found that they proceeded immediately towards boxes which contained honey concealed from their view; and such in fact is the situation of the seed of the nectarea in flowers. Some odors, especially the fumes of tobacco, and indeed all kinds of smoke, are highly obnoxious to them: this is the case also with the smell of oil of turpentine, alcohol, ammonia, the nitric and muriatic acids, and several other volatile chemical agents; upon receiving the impressions of which, they immediately set about ventilating themselves. But nothing excites their displeasure in a greater degree than the breath of the spectator; as soon as they feel which, they show signs of anger, and prepare to revenge it as an insult. The odor of the poison of their sting produces similar effects, exciting them to immediate rage and hostility.

It is sufficiently clear that many insects possess the power of *smell*, yet the particular organ of this sense has never been ascertained. Various opinions have been supported more by arguments drawn from the analogy of what happens in other classes of animals than by any direct experiments on insects themselves. We know that in all animals respiring by means of lungs, the organs of smell are placed at the entrance of the passages of the air; and it has often been concluded that, in like manner, the stigmata, or the orifices of the air-tubes, were the seat of this sense in insects. By others the antennæ have been assigned as the organs through which these impressions were conveyed to the sensorium. The experiments of Huber have proved that neither of these opinions is correct; and have satisfactorily shown that in the bee this sense resides in the mouth itself, or in its immediate vicinity. Here indeed would be its proper station, if this faculty be intended, as we may reasonably suppose it to be, to apprise the individual of the qualities of the food prior to its being eaten. When the mouth of a bee was plugged up with paste, which was allowed to dry before the insect was set at liberty, it remained quite insensible to the same odors at which it had before manifested the strongest repugnance.

Bees, it is generally supposed, possess the sense of *hearing;* but the evidence is by no means conclusive; for we find that they are noways disturbed by a loud clap of thunder, or by the report of a gun, or any other noises that may happen to arise around them. It is, however, certain that they are capable of emitting a variety of sounds, which appear expressive of anger, fear, satisfaction, and other passions, and it would seem that they were even capable of communicating certain emotions to one another in this manner. Huber observed that the queens, during their captivity, sent forth a peculiar sound, which he supposes to be a note of lamentation. A certain cry, or humming noise from the queen, also strikes with sudden consternation all the bees in the hive. Hunter has noticed a number of modulations of sound emitted by bees under different circumstances, and has instituted an inquiry concerning the means employed by them in producing these sounds, for an account of which see his paper in the Philosophical Transactions.

Buffon refuses to allow bees any portion of intelligence, and contends that the actions we behold, however admirably they are directed to certain ends, are in fact merely the results of their peculiar mechanism. Other philosophers, such as Reaumur, have gone into the opposite

extreme, and have considered them as endued with extraordinary wisdom and foresight, animated by a disinterested patriotism, and a variety of moral and intellectual qualities of high order. The truth, no doubt, lies between these opinions.

'In no department of natural history,' says an able contemporary, 'is it more necessary to be aware of the proper import of the term instinct, than in studying the phenomena presented by the bee; for nowhere is it more difficult to discriminate between the regular operation of implanted motives, and the result of acquired knowledge and habits. The most striking feature of their history, and the one which apparently lays the foundation for those extraordinary qualities which raise them above the level of other insects, is the disposition to social union. It may in general, indeed, be remarked, that animals which associate together so as to form large communities, display a higher degree of sagacity than those who lead a solitary life. This is especially observable among insects. The spider and formica leonis may exhibit particular talents, or practise particular stratagems in the pursuit and capture of their prey; but their history is limited to a single generation, and embraces none of those interesting relations which obtain between individuals composing the gregarious tribes, such as the ant, the wasp, and the bee. Among these we trace a community of wants and desires, and a mutual intelligence and sympathy, which lead to the constant interchange of good offices, and which, by introducing a systematic division of labor, amidst a unity of design, leads to the execution of public works on a scale of astonishing magnitude. The attachment of bees to their hive, which they defend with a courage and self-devotion truly admirable, their jealousy of intruders, their ready co-operation in all the labors required for the welfare of the community, their tender care of their young, the affection and homage which they bestow on their queen, and which they manifest on all occasions in the most unequivocal manner, imply qualities such as we could hardly persuade ourselves could animate a mere insect, on which we are in the habit of proudly looking down as placed in one of the lowest orders of created beings.'

More has been written on the history and economy of this insect, than on those of, perhaps, any other animal. To the foregoing particulars the experiments of Huber, Huish, and Howison have added some remarkable facts. On the subject of their fecundation Linnæus seems originally to have suggested the right idea; i. e. that after all that has been said respecting its similarity to that of fishes, an actual union takes place between the queen and the drones. He seems also to have suspected that this union proved fatal to the latter. This opinion has in both points been now verified. In numerous experiments made by Huber during the years 1787 and 1788, he found that the young queens are never impregnated so long as they remain in the interior of the hive: if confined within its walls they continue barren, though amidst a seraglio of males. To receive the approaches of the male the queen soars high in the air, choosing that time of day when the heat has induced the drones to issue from the hive; and love is now ascertained to be the motive of the only distant journey which a young queen ever makes. From this excursion she returns in the space of about half an hour, with the most evident marks of fecundation; for, far from being satisfied with the prolific aura of Swammerdam, she actually carries away with her the ipsa verenda of the poor drone, who never lives to see his offspring, but falls a sacrifice to the momentary bliss of his aërial amour. The most complete proof of these facts is afforded by the detail of a number of concurring experiments. It is curious that Bonner should have remarked those aërial excursions of the young queens, without ever suspecting their real object, or observing the marks of fecundation upon their return to the hive. M. Huber also assigns a cause for the existence of such a great number of males. As the queen is obliged to traverse the expanse of the atmosphere, he observes, it is requisite the males should be numerous, that she may have the chance of meeting some one of them. But the reason why impregnation cannot be accomplished within the hive has not yet been ascertained; nor is the cause here assigned for the great number of males quite satisfactory.

M. Huber also states his accidental discovery of the very singular and unexpected consequences, which follow from retarding the impregnation of the queen-bee beyond the twentieth or twenty-first day of her life. In the natural order of things, or when impregnation is not retarded, the queen begins to lay the eggs of workers forty-six hours after her intercourse with the male, and she continues for the subsequent eleven months to lay none but these; 'and it is only after this period, that a considerable and uninterrupted laying of the eggs of drones commences. When, on the contrary, impregnation is retarded after the twentieth day, the queen begins, from the forty-sixth hour, to lay the eggs of drones; and she lays no other kind during her whole life.' It would be tedious to detail the experiments; they were numerous, and the results uniform. 'I occupied myself,' says M. Huber, 'the remainder of 1787, and the two subsequent years, with experiments on retarded fecundation, and had constantly the same results. It is undoubted, therefore, that when the copulation of queens is retarded beyond the twentieth day, only an imperfect impregnation is operated; instead of laying the eggs of workers and of males equally, she will lay those of males only.' This discovery is entirely M. Huber's own. A single interview with the male appears sufficient, according to this writer, for fecundifying the whole eggs that a queen will lay in the course of at least two years. 'I have every reason to think,' he adds, 'that a single copulation will impregnate all the eggs that she will lay during her whole life; but I want absolute proof for more than two years.' A similar fact, as we have seen, occurs in the economy of the aphis, which, by a single impregnation, is well known to produce several successive generations. See APHIS.

A queen, in ordinary circumstances, lays about 3000 eggs in the space of two months.

which is at the rate of fifty a-day. It was not correctly ascertained whether the queens, whose impregnation was retarded, laid a number of drone eggs corresponding to the whole number of eggs, both of workers and drones, which they ought to have deposited; but it is certain that they laid a greater number of drone eggs than they ought naturally to have done. The hives in which only drones were produced, always failed; and, indeed, generally broke up before the queens had done laying; for, after the lapse of some time, the workers finding themselves overwhelmed with drones, 'fruges consumere nati,' and receiving no increase of their own number, abandoned the hive, and at the same time despatched their unfortunate sovereign. In order to throw some light on this curious subject, M. Huber suggests the propriety of instituting analogous experiments on other insects; by retarding, for example, the impregnation of the females of other species of bees, of wasps, and of butterflies.

In the course of additional experiments, some other curious points in the natural history of the bee were accidently illustrated. Thus a queen, twenty-seven days old, having been impregnated on the 31st of October, did not begin to lay at the expiration of forty-six hours, apparently on account of the weather having, in the mean time, become extremely cold. She was confined in a hive all the winter; and, on the 4th of April ensuing, prodigious numbers both of larvæ and pupæ were found; and all of them produced drones.

M. Huber had also an opportunity of correcting those naturalists who maintain, that the working bees are charged with the task of conveying into proper cells such eggs as may be misplaced by the queen. He put a queen, who was ready to lay workers' eggs, into a prepared hive, which contained only the cells of drones, but which communicated by a narrow tube, sufficient to permit workers to pass, but too small for the queen, with another hive, which contained plenty of the cells of workers. The queen, taught by nature the kind of eggs she was about to lay, searched about for suitable cells; but, finding none, she chose rather to drop her eggs at random, than place those of workers in the cells of drones. The eggs thus dropped, soon disappeared; and careless observers might have concluded that they were carried off by the workers to the proper cells; but none were to be seen there; and the author soon ascertained that they were really eaten up by the workers. Thus it was proved, that the care of depositing properly the respective kinds of eggs is left entirely to the instinct of the queen, and that the workers running off with misplaced eggs, in order to devour them, has been mistaken for their tenderly conveying them to the right cells.

The working-bees had for ages been considered as entirely destitute of sex; and hence, in the writings of many authors, they are denominated neuters. From the experiments of Schirach and of Huber, it seems now to be clearly ascertained that the workers are really of the female sex; but that the organs of generation are small and imperfect, being capable, however, of development, if the larvæ be fed with royal jelly.

M. Huber confirms the curious discovery of M. Schirach, that when bees are by any accident deprived of their queen, they have the power of selecting one or two grubs of workers, and of converting them into queens.

M. Huber next relates some experiments which confirm the singular discovery of M. Riems, concerning the existence, occasionally, of common working-bees that are capable of laying eggs; which, we may remark, is certainly a most convincing proof of their being of the female sex. Eggs were observed to increase in number daily in a hive in which there were no queens of the usual appearance; but small queens considerably resemble workers, and to discriminate them required minute inspection. 'My assistant,' says M. Huber, 'then offered to perform an operation that required both courage and patience, and which I could not resolve to suggest, though the same expedient had occurred to myself. He proposed to examine each bee in the hive separately, to discover whether some small queen had not insinuated herself among them, and escaped our first researches. It was necessary, therefore, to seize every one of the bees, notwithstanding their irritation, and to examine their specific character with the utmost care. This my assistant undertook, and executed with great address. Eleven days were employed in it; and, during all that time, he scarcely allowed himself any relaxation, but what the relief of his eyes required. He took every bee in his hand; he attentively examined the trunk, the hind limbs, and the sting; and he found that there was not one without the characteristics of the common bee; that is, the little basket on the hind legs, the long trunk, and the straight sting.' They afterwards seized a fertile worker in the very act of laying.

The origin of these supplementary queens, as they may be called, is accounted for, from their having passed the vermicular state in cells contiguous to the royal ones; and from their having, at an advanced period, devoured some portion of the stimulating jelly which was destined for the nourishment of the royal brood. They are objects of jealousy and animosity to the queen-bee; but how they become impregnated has not been ascertained. It has not, indeed, been directly ascertained that all fertile workers proceed from larvæ that have received portions of the royal food; but M. Huber observed that they were uniformly such as had passed the vermicular state in cells contiguous to the royal ones. 'The bees,' he remarks, 'in their course thither, will pass in numbers over them, stop, and drop some portion of the jelly destined for the royal larvæ.' This reasoning, though not conclusive, is plausible. The result is so uniform, that M. Huber says, he can, whenever he pleases, produce fertile workers in his hives.

When a supernumerary queen is produced, or introduced into a hive in the course of experiment, either she or the rightful owner soon perishes. The German naturalists, Schirach and Riems, imagined that the working-bees assailed the stranger and stung her to death. Reaumur

considered it as more probable, that the sceptre was made to depend on the issue of a single combat between the claimants; and this conjecture is verified by the observations of Huber. The same hostility towards rivals, and destructive vengeance against royal cells, animates all queens, whether they be virgins, or in a state of impregnation, or the mothers of numerous broods. The working-bees, it may here be remarked, remain quiet spectators of the destruction, by the first-hatched queen, of the remaining royal cells; they approach only to share in the plunder presented by their havoc-making mistress, greedily devouring any food found at the bottom of the cells, and even sucking the fluid from the abdomen of the nymphs before they toss out the carcases. The following fact, connected with this subject, is one of the most curious perhaps in the whole history of this wonderful insect: Whenever the workers perceive that there are two rival queens in the hive, numbers of them crowd around each: they seem to be perfectly aware of the approaching deadly conflict, and willing to prompt their amazonian chieftains to the battle; for, as often as the queens show a disinclination to fight, or seem inclined to recede from each other, or to fly off, the bees immediately surround and detain them; but when either combatant shows a disposition to approach her antagonist, all the bees forming the clusters instantly give way to allow her full liberty for the attack. It seems strange that those bees who in general show so much anxiety about the safety of their queen, should, in particular circumstances, oppose her preparations to avoid impending danger—should seem to promote the battle, and to excite the fury of the combatants.

When a queen is removed from a hive, the bees do not immediately perceive it; they continue their labors, 'watch over their young, and perform all their ordinary occupations. But, in a few hours, agitation ensues; all appears a scene of tumult in the hive; singular humming is heard; the bees desert their young; and rush over the surface of the combs with a delirious impetuosity.' They have now evidently discovered that their sovereign is gone; and the rapidity with which the bad news spreads through the hive, to the opposite side of the combs, is very remarkable. On replacing the queen in the hive tranquillity is almost instantly restored. The bees, it is worthy of notice, recognise the individual person of their own queen. If another be palmed upon them they seize and surround her, so that she is either suffocated or perishes by hunger; for it is very remarkable, that the workers are never known to attack a queen-bee with their stings. If, however, more than eighteen hours have elapsed before the stranger queen be introduced, she has some chance to escape: the bees at first seize and confine her; but less rigidly; and they soon begin to disperse, and at length leave her to reign over a hive in which she was at first treated as a prisoner. If twenty-four hours have elapsed, the stranger will be well received from the first, and at once admitted to the sovereignty of the hive. In short, it appears that the bees when deprived of their queen, are thrown into great agitation; that they wait about twenty hours, apparently in hopes of her return; but that after this interregnum, the agitation ceases; and they set about supplying their loss by beginning to construct royal cells. It is when they are in this temper, and not sooner, that a stranger queen will be graciously received; and upon her being presented to them, the royal cells, in whatever state of forwardness they may happen to be, are instantly abandoned, and the larvæ destroyed. Reaumur must therefore have mistaken the result of his own experiments, when he asserts, that a stranger queen is instantly well received, though presented at the moment when the other is withdrawn. He had seen the bees crowding around her at the entrance of the hive, and laying their antennæ over her; and this he seems to have taken for caressing. The structure of the hives he employed prevented him from seeing further: had he used the leaf-hive, or one of similar construction, he would have perceived that the apparent caresses of the guards were only the prelude of actual imprisonment.

After the season of swarming, it is well known, a general massacre of the drones is commenced. Several authors assert that the workers do not sting the drones to death, but merely harass them till they be banished from the hive and perish. M. Huber contrived a glass table, on which he placed several hives, and he was thus able to see distinctly what passed in the bottom of the hive, which is generally dark and concealed: he witnessed a real and furious massacre of the males, the workers thrusting their stings so deep into the bodies of the defenceless drones, that they were obliged to turn on themselves as on a pivot, before they could extricate them. The work of death commenced in all the hives much about the same time. It is not, however, by a blind or indiscriminating instinct that the workers are impelled thus to sacrifice the males; for if a hive be deprived of its queen no such massacre takes place in it; but the males are allowed to survive the winter.

From Mr. Huish and Dr. Howison's writings on this subject we shall select a few concluding practical observations. The first of these gentlemen objects decidedly to the crowding of hives together in an apiary. During the swarming season it is often attended with very destructive consequences. He was once requested by a gentleman to perform an experiment upon a hive, which was placed on the same bench with six others, and in attempting to move the hive destined for the operation, the others were agitated, and the whole apiary became in a little time in a state of confusion. The easy access also, which the bees of one hive have to those of another, promotes quarrels and murderous battles. It is an erroneous opinion, he says, though held by some skilful apiarians, that all the bees of one apiary know each other, and that it is only the bees of a foreign apiary with whom they quarrel. Mr. Huish having been often witness of the destructive animosity of these little insects, and the wars which they wage upon the weaker hives in their own establishment, endeavours to impress it strongly upon the attention of every apiarian, to place every hive upon a respective

pedestal. Another advantage particularly arises from the use of a single pedestal, which is, that the hive may be chained down and locked.

The apiary and all its contents should be kept particularly clean; all noxious weeds carefully removed, and no rubbish be left in which the enemies of the bees can conceal themselves. A few low trees or shrubs, planted in the vicinity of the apiary, will be found useful in arresting the flight of the swarms, for they very often alight on espalier trees, or on currant and gooseberry bushes. It is essential, however, to observe, that the apiary should not be incommoded with herbs or plants, which rise to a height equal to or exceeding the entrance of the hive; because the bees, on their arrival from their journeys, being much fatigued, are impeded by these plants, and regain their habitation with difficulty. If they touch these plants on passing they often fall to the ground and become victims to their enemies, or are unfortunately trodden under foot. Such plants also serve the purpose of a ladder for the enemies of the bees to ascend into the hive, and especially the ants, which in some districts are particularly numerous. These little insects are a great detriment to a hive, and they baffle the most vigilant attention of the apiarian to prevent their depredations. A small leaden reservoir of water, encircling the bottom of the pedestal, is of great service in preventing the ascent of these insects. The vicinity of great towns is not a proper situation for bees. The smoke of a city is very detrimental to them, and the chimneys are in general the resort of the swallows and martens, who are great destroyers of these insects.

The position of hives, according to Dr. Howson, should be such as to receive the rays of the rising as well as meridian sun; heat and light appearing the principal stimulants to the action of bees. A hive so situated as not to be touched by the sun until some hours later than the other hives in the same garden, would, in the course of the season, lose a proportional number of days' labor. Hives should stand at some distance from walls and hedges. These are often much infested with snails in summer, and mice in winter. Huish recommends placing every hive upon a single pedestal, and at two or three feet distance from each other. By this means when any thing happens to one hive, the others are less likely to be disturbed than when placed on a shelf in a bee-house; and the hive may be chained down and locked. It is usual to have three or four legs or supports to the bee boards, but those who have tried one will never resort more, as one is a much better protection from vermin and insects.

The annexed diagram represents the figure of this gentleman's hive, which is thus described: It is so constructed interiorly that each comb may be extracted by itself without changing the rest; the combs being attached to slips of board placed across the mouth or top of the hive, any one of them may be lifted up, and to effect this operation the tapering construction of the interior is favorable. To prevent the bees from working between the slips, air is admitted by means of pierced plates of tinned iron; and to prevent human thieves from carrying off the whole hive, it is chained and padlocked to a strong post, which serves also as a fulcrum. The inventor of this hive has tried it, he says, for nearly twenty years. 'At any time and season when I require some honeycomb, or at the end of the season when I deprive my bees of their superfluous store, I open the top, and take the side-boards out, from which having cut the honeycomb, I replace them in the hive, and the operation is facilitated by having some vacant boards ready to supply the place of the full ones. This operation is very easily and speedily performed; it has the advantage of not disturbing the middle combs, and I have often deprived these hives of their honey without the loss of a single bee, excepting those few who left their stings in various parts of my dress. Two very considerable advantages arise from the use of this hive: in the first place, there is never any occasion to make an addition to the hive at the bottom, when the bees, by lying out in clusters, declare that they stand in need of room; for the operation of depriving them of a part of their combs from the top, will give them the room which they require, and which they will soon replenish with honey. In the common hive it is customary, in this case, to place, what is called in Scotland an eek, which consists of from four to six bands of the same diameter as the hive; but, on taking away this eek in the autumn, I have seen the most injurious consequences result to the hive. It is in general performed by cutting the combs with a wire between the hive and the eek, and then whilst one person lifts up the hive, another draws the eek away; the hive then rests on the stool. Few persons, however, consider that, as the combs are cut parallel with the bottom of the hive, they will all touch the stool on which it stands, and I have thus known a whole hive perish. The second advantage is, that the whole of the interior of the hive is open to your inspection, and you are thus enabled to examine the devastation of the moth, or to ascertain the presence of any other enemy.'—*Treatise on Bees*, p. 85.

Dr. Howison's hive, figs. 1 to 3, for obtaining the honey without killing the bees, 'consists of two distinct hexagons, figs. 1, 2; one placed above the other. The under is formed of six panes of half-inch deal, each measuring ten inches in width and eight in depth, and covered with a thin board at top. This forms a box that will contain two pecks' measure of corn, and which he considers sufficient for the largest swarm. This is intended for the breeding, as well as winter habitation, of the bees. The upper is of the same dimensions and form as the under at bottom, but in order to give it a conical shape, for the more conveniently fixing thereon a coat of straw, the panes at top are only five inches wide, which is also covered by a piece of board. The upper box has a moulding, fig. 1, *a*, fixed to its under part, which projects about a quarter of an inch, and so exactly embraces the upper part of the lower box, as to join these two firmly together. In the deal which forms the top of the

lower box, are cut four oval holes, fig. 2, *c*, each one inch wide and two inches long, through which the bees pass into the upper. This communication, when not wanted, is shut by a board which moves on a nail in its centre. The small pane

Fig. 1.

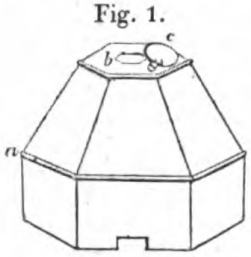


Fig. 2.

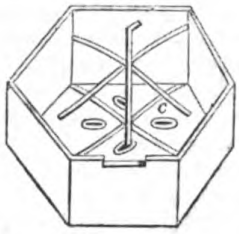
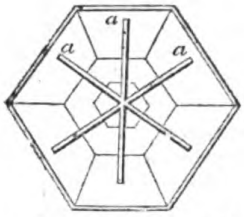
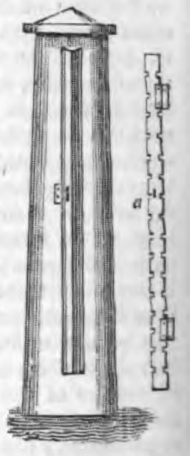


Fig. 3.



of glass, fig. 1, *b*, in the top of the upper box, admits of seeing the progress the bees have made in it, without separating it from the lower one. This pane is covered to exclude light and cold or heat by a small shutter *c*. When the swarm is first put into the lower box, the communication is shut with the upper, until the bees have completely filled the lower with combs. The communication is then to be opened, when the bees will ascend; and, if the season is favorable and the swarm numerous, they will fill it also, but not until they have completely stocked the lower. By removing the straw covering, and looking through the glass in the upper box, it may be seen what honey has been collected. Should a part or the whole of it be wanted, it will only be necessary carefully to separate the upper from the lower box, and shut the board of communication. The upper box is then to be removed to some distance, and the bees contained in it driven off, on which they will immediately join their companions in the lower. So soon as the honey is taken from the box, it can be replaced, and if early in the season, the communication opened for making more honey, but if late, it must be kept shut until the hive has swarmed next summer. Both the lower hexagon, fig. 2, and the upper, fig. 3, contain the usual cross horizontal sticks *aaa* for supporting the combs. If honeycomb early next season is preferred to a swarm, then the communication must be opened about the beginning of June. All the honey procured in this way is remarkable for its purity, none of the cells having been ever polluted by the hatching of young bees. The greatest advantages, however, from this method, are the early and large swarms; the consequence of not killing the bees.'

'After all that has been done in England, France, and Italy,' says Mr. Loudon, 'the bee is still more successfully cultivated and finer honey produced in Poland, by persons who never saw a book upon the subject, or heard of the mode of depriving bees of their honey without taking their lives.' The Polish hive appears to this writer second in merit to the 'straw, thimble, or flower-pot hive placed in an inverted position: and perhaps,' he says, 'it may deserve the preference, if the mode of using it were generally known. It is simply the trunk of a tree, of a foot or fourteen inches in diameter and about nine feet long. It is scooped out (boring in this country would be better) for about six feet from one end, so as to form a hollow cylinder of that length, and of six or eight inches diameter within. Part of the circumference of this cylinder is cut out during the greater part of its length, about four inches wide, and a slip of wood is made to fit the opening. On the sides of this slip or segment (*a*) notches are made every two or three inches, of sufficient size to allow a single bee to pass. This slip may be furnished with hinges and with a lock and key; but in Poland it is merely fastened in by a wedge. All that is wanting to complete the hive is a cover at top to throw off the rain, and then it requires only to be placed upright like a strong post in the garden, so as the bottom of the hollow cylinder may be not nearer the ground than two feet, and the opening slip look to the south. When a swarm is to be put in, the tree, with the door or slip opened, is placed obliquely over it; when the bees enter the door is closed, and the holes stopped with clay till the hive is planted or placed upright. When honey is wanted, the door is opened during the finest part of a warm day, when most of the bees are out; its entire state is seen from top to bottom, and the operator, with a segar in his mouth, or with a lighted rag, to keep off the bees from his hands, cuts out with a crooked knife as much comb as he thinks fit. In this way fresh honey is obtained during the summer, the bees are never cramped for room, nor does it become necessary to kill them. The old comb, however, is annually cut out to prevent or lessen the tendency to swarming, which, notwithstanding this and the size of their dwelling, they generally do once a year; for the laws of nature are not to be changed. Though it be a fact, that a small swarm of bees will not do well in a large hive, yet if the hive extend in length and not in breadth, it is admitted both by Huber and Huish that they will thrive in it. 'If too great a diameter,' says Huber, 'be not given to the abode of the bee, it may without danger be increased in the elevation.'



We subjoin Dr. Howison's mode of management as one of the simplest and most effectual for the common end in view. If the lives of the bees are to be saved, then some of the other hives may be tried; and the most suitable for this purpose is, perhaps, the Polish hive; the most ingenious, and the fittest for an amateur, is no doubt that of Huish. But as the latter author

justly remarks, 'there is no certain method, nor will one ever be discovered, by which a great harvest of wax and honey, and great swarms can be obtained at pleasure: these are chimeræ, which it is folly to pursue; because the former depends on the seasons being more or less favorable to the secretion of honey, on the countries which the bees inhabit being more or less wooded and covered with flowers, and the latter on the fecundity of the queen. Hence that annual difference between the harvest of honey and wax, and the largeness or smallness of the swarms which is found in all countries. To the same causes may be attributed the fact, that a mode of treatment which has succeeded one year, will not succeed the next, although the circumstances be almost the same in appearance. It is these differences and variations, which, for the period of fifty-five years, have given rise to hives of different forms and materials, which have only tended to instruct us, that bees can inhabit, work, and collect provisions in vessels of every form, from the excavated trunk of the tree, as it is used in Poland and the northern countries, to the expensive and useless glass hive, or to the hive of Du Hamel; and, where no hollow trunk of the tree can be found, in the holes of walls, in chimneys, and under the roofs.'

To the common observer, all working bees, as to external appearance, are nearly the same; but to those who examine them with attention, the difference in size is very distinguishable; and they are in their vicious and gentle, indolent and active natures, essentially different. 'Of the stock which I had in 1810,' says Howison, 'it required 250 to weigh an ounce; but they were so vicious and lazy, that I changed it for a smaller variety, which possesses much better dispositions, and of which it requires 296, on an average, to weigh an ounce. Whether size and disposition are invariably connected, I have not yet had sufficient experience to determine.

Hives made of straw, as now in use, have a great advantage over those made of wood or other materials, from the effectual defence they afford against the extremes of heat in summer and cold in winter. That the hives in size should correspond as nearly as possible with that of the swarms, has not had that attention paid to it which the subject demands, as much of the success in the management of bees depends on that circumstance. From blind instinct, bees endeavour to fill with combs whatever hive they are put into, before they begin to gather honey. Owing to this, when the hive is too large for its inhabitants, the time for collecting their winter store is spent in unprofitable labor; and starvation is the consequence. This evil also extends to causing late swarming the next summer; it being long before the hive becomes so filled with young bees as to produce a necessity for emigration, from which cause the season is too far advanced for the young colonies to procure a winter stock. I should consider it as a good rule in all cases, that the swarm should fill two-thirds of the hive. The hives used by me for my largest swarms, weighing from five to six pounds, will contain two pecks' measure of corn, and will yield, in a good season, eight Scots pints of honey, and for smaller swarms in proportion. Hives with empty combs are highly valuable for second swarms, as the bees are thereby enabled much sooner to begin collecting honey.

As to the feeding of bees, near the sea little honey is collected after the first week in August; but in high situations, where the flowers are later and heath abounds, the bees labor with advantage until the middle of September. These are the proper periods, according to situation, for ascertaining if the hives intended to be kept contain a sufficient winter stock. The killing of the drones perhaps marks this time with more precision. If a large hive does not weigh thirty pounds, it will be necessary to allow it half a pound of honey, or the same quantity of soft sugar made into a syrup for every pound that is deficient of that weight; and in like proportion to smaller hives. This work must not be delayed, that time may be given for the bees to make the deposit in their empty cells before they are rendered torpid by the cold. I must here notice, that sugar simply dissolved in water (which is a common practice), and sugar boiled with water into a syrup, form compounds very differently suited for the winter store of bees. When the former is wanted for their immediate nourishment, as in spring, it will answer equally as a syrup; but if to be laid up as a store, the heat of the hive quickly evaporating the water, leaves the sugar in dry crystals, not to be acted upon by the trunks of the bees. I have known several instances of hives killed by hunger while some pounds' weight of sugar in this state remained in their cells. The boiling of sugar into syrup forms a closer combination with the water, by which it is prevented from flying off, and a consistence resembling that of honey retained. I have had frequent experience of hives not containing a pound of honey, preserved in perfect health through the winter, with sugar so prepared, when given in proper time, and in sufficient quantity.

Bees are evidently natives of a warm climate, a high temperature being absolutely necessary to their existence; and their continuing to live in hollow trees during the severe winters of Russia and America, must depend on the heat produced from the great size of the swarms which inhabit these abodes. From my own observations, the hives which are best covered during winter, always prosper most the following summer. In consequence, about the end of harvest, I add to the thin covering of straw put on the hives at the time of swarming a thick coat, and shut up the aperture through which the bees entered, so that only one can pass at a time. Indeed, as a very small portion of air is necessary for bees in their torpid state, it were better, during severe frosts, to be entirely shut up, as numbers of them are often lost from being enticed to quit the hive by the sunshine of a winter day. It will, however, be proper at times to remove, by a crooked wire or similar instrument, the dead bees and other filth, which the living at this season are unable to perform of themselves. To hives whose stock of honey was sufficient for their maintenance, or those to which a proper quantity of sugar had been given for that purpose, no

further attention will be necessary, until the breeding season arrives. This, in warm situations, generally takes place about the beginning of May, and in cold, about a month after. Owners of hives are often astonished, that, at this advanced season, when their bees had, for weeks preceding, put on the most promising appearance, after a few days rain they become so weak and sickly as to be unable to leave the hive, and continue declining until they at last die. From paying attention to this subject, I am convinced that the cause is as follows: The young bees for a short time previous to their leaving their cells, and some time after, require being fed with the same regularity that young birds are by their parents; and if the store in the hive be exhausted, and the weather such as not to admit of the working-bees going abroad to collect food in sufficient quantity for themselves and their brood, the powerful principle of affection for their young compels them to part with what is not enough for their support, at the expense of their own lives. To prevent such accidents, I make it a rule, that if during the breeding season it rains for two successive days, to feed all the bees indiscriminately, as it would be difficult to ascertain those only who require it.

'For several years past,' continues Dr. H. 'my hives have uniformly sent forth their first swarms during the second week in July, from which it appears that early or late swarming, in the same situations, is not so much regulated by good or bad seasons as might have been expected. Near the sea this will of course take place some weeks earlier. The first swarming is preceded by the appearance of drones, and hanging out of working-bees. The signs of the second are more equivocal, the most certain being that of the queen, a day or two before swarming, at intervals of a few minutes, giving out a sound a good deal resembling that of a cricket. It frequently happens that the swarm will leave the old hive and return again several times, which is always owing to the queen not having accompanied them, or from having dropped on the ground, being too young to fly to a distance. In such cases I have seen her found near the old hive, and on being taken up and placed in the new one, the swarm instantly settled. When a hive yields more than two swarms, these should uniformly be joined to others that are weak, as from the lateness of the season, and deficiency in number, they will otherwise perish. This junction is easily formed by inverting at night the hive in which they are, and placing over it the one you intend them to enter. They soon ascend, and apparently with no opposition from the former possessors, as I have never observed fighting to be a consequence. It being very universally believed, that two queens cannot live together in the same hive, I have for several days after this forced junction, searched for the murdered queen, but never with success. Should the weather for some days after swarming be unfavorable for the bees going out, they must be fed with care until it clears up, otherwise the young swarm will run a great risk of dying.—*Howison in Mem. Caled. Hort. Soc.*

Taking the honey may be effected even with hives of the common construction, by three modes—partial deprivation, total deprivation, and suffocation.

Partial deprivation is performed about the beginning of September. 'Having ascertained the weight of the hive, and consequently the quantity of honeycomb which is to be extracted, begin the operation as soon as evening sets in, by reverting the full hive, and placing an empty one over it; particular care must be taken that the two hives are of the same diameter; for if they differ in their dimensions, it will not be possible to effect the driving of the bees. The hives being placed on each other, a sheet or large table-cloth must be tied round them at their point of junction, in order to prevent the bees from molesting the operator. The hives being thus arranged, beat the sides gently with a stick or the hand; but particular caution must be used to beat it on those parts to which the combs are attached, and which will be found parallel with the entrance of the hive. The ascent of the bees into the upper hive will be known by a loud humming noise, indicative of the pleasure in finding an asylum from their enemy: in a few minutes the whole community will have ascended, and the hive, with the bees in it, may be placed upon the pedestal from which the full hive was removed. The hive, from which the bees have been driven, must then be taken into the house, and the operation of cutting out the honeycomb commences. Having extracted the requisite quantity of comb, this opportunity must be embraced of inspecting the hive, and of cleaning it from any noxious matter. In cutting the combs, however, particular attention should be paid not to cut into two or three combs at once; but having commenced the cutting of one, to pursue it to the top of the hive; and this caution is necessary for two reasons: If you begin the cutting of two or three combs at one time, were you to extract the whole of them, you would, perhaps, take too much; and, secondly, to stop in the middle of a comb, would be attended with very pernicious consequences, as the honey would drop from the cells which have been cut in two, and then the bees, on being returned to their native hive, might be drowned in their own sweets. The bees also, in their return to their natural domicile, being still under the impression of fear, would not give so much attention to the honey which flows from the divided cells; and as it would fall on the board, and from that on the ground, the bees belonging to the other hives would immediately scent the wasted treasure, and a general attack upon the deprivated hive might be dreaded. The deprivation of the honeycomb being effected, the hive may be returned to its former position, and reversing the hive which contains the bees, and placing the deprivated hive over it, they may be left in that situation till the morning, when the bees will be found to have taken possession of their native hive; and, if the season proves fine, may replenish what they have lost.'—*Huish's Treatise on Bees.*

Total deprivation is effected in the same manner, but earlier in the season, immediately after the first swarm; and the bees, instead of being

returned to a remnant of honey in their old hive, remain in the new empty one, which they will sometimes, though rarely, fill with comb. By this mode, it is to be observed, very little honey is obtained, the bees in June and July being occupied chiefly in breeding, and one, if not two, swarms are lost

Suffocation is performed when the season of flowers begins to decline, and generally in October. The smoke of paper, or linen rag soaked or smeared with melted sulphur, is introduced to the hive by placing it on a hole in the ground, where a few shreds of these articles are undergoing a smothering combustion; or the full hive may be placed on an empty one, inverted as in partial deprivation, and the sulphurous smoke introduced by fumigating bellows, &c. The bees will fall from the upper to the lower hive in a few minutes, when they may be removed and buried to prevent resuscitation. Such a death seems one of the easiest, both to the insects themselves and to human feelings. Indeed, the mere deprivation of life to animals not endowed with sentiment or reflection, is reduced to the precise pain of the moment, without reference to the past or the future; and as each pulsation of this pain increases in effect on the one hand, so on the other, the susceptibility of feeling it diminishes.

'Much has been said about the cruelty of killing bees,' says Mr. Loudon, 'but if man is entitled to deprive them either totally or partially of their food, he has an equal right (and, in truth, by that very act exercising it) of depriving them of their lives. For of the hives that have been partially or wholly deprived of their honey, it may be safely affirmed, that there is not one in ten that does any good. If they live till the succeeding spring, they are commonly too weak to collect food or to breed, and, being plundered by their neighbours, dwindle away, till at last the hive is without inhabitants. A prompt death is surely preferable to one so protracted.' Some judicious observations on this subject will be found in Huish's book, extracted from the works of La Grenée, a famous French apiarian.

Apis, in numismology. The bee was represented on the coins of many cities, as the symbol of new colonies; as in the annexed figure of an Ephesian coin:

APITES, Apitis Vinum; from *απιος*, the pear-tree; perry. See Perry.

APITPAT. From pit, to sink, and pat, to strike. The motion of the heart in a state of anxiety.

O, there he comes. Welcome, my bully, my buck! gad, my heart has gone *apitpat* for you. *Congreve.*

APIUM, Parsley, a genus of the digynia order, and pentandria class of plants; natural order forty-fifth, umbellatæ. The fruit is of an oval shape, and streaked; the involucrum consists of one leaf; and the petals are inflected and equal. There are only two species, the culture of which is well known, viz. 1. A. graveolens, or smallage, a native of Britain; and 2. A. petroselinum, or common parsley, a native of Sardinia. The roots and seeds of the petroselinum are used in medicine. The root of parsley is one of the five aperient roots, and in this intention is sometimes made an ingredient in apozems; if too liberally used, it is apt to occasion flatulencies; and thus, by distending the viscera, to produce a contrary effect to that intended by it: the taste of this root is somewhat sweetish, with a light degree of warmth and aromatic flavor. The seeds are an ingredient in the electuary of bay berries. The roots of smallage are also in the number of aperient roots, and have been prescribed as an ingredient in aperient apozems and diet-drinks, but are at present disregarded. The seeds of the plant are moderately aromatic, and were formerly used as carminatives; in which intention they are, doubtless, capable of doing service, though the other warm seeds, which the shops are furnished with, render these unnecessary.

APIVORUS, a species of falco. See Falco.

APLACE'. In place.

For there is but a God of all,
Whiche is the lorde of heuen and helle.
But if it like you to telle,
Howe suche goddes come *aplace*,
Ye might mochell thanke purchase.
Gower. Con. A. bk. v.

APLANATIC, a term applied to that kind of refraction which completely corrects the abberration of the rays of light, and the color depending thereon, in contradistinction to Achromatic, in which there is only a partial correction of color. Dr. Blair, of Edinburgh, discovered in 1791, that a mixture of solutions of ammoniacal and mercurial salts, and also some other substances, produced dispersions proportional to that of glass, with respect to the different colors; and he proceeded to construct a compound lens, consisting of a semi-convex one of crown glass, with its flat side towards the object, and a meniscus of the same materials, with its convex side in the same direction, and its flatter concave next to the eye; and the interval between these lenses he filled with a solution of antimony in a certain proportion of muriatic acid. The lens thus artificially adapted did not manifest the slightest vestige of any extraneous color.

APLANES; *απλανης*, not wandering; the fixed stars, so called in opposition to the planets.

APLIGHT'. Supposed to be the same as In plight. In good plight or condition.

Anon fire she a-light,
And warmed it well *aplight*;
She gave it suck upon her barm,
And sith then laid it to sleep warm.
Lay de Fraine, in Ellis's Romance.

Nou is Edward of Carnarvon,
King of Engelond all *aplight*,
God lete him ner be worse man,
Then his fader, ne lasse of myht.
Percy's Reliques, vol. ii.

APLUDA, a genus of the monœcia order, belonging to the polygamia class of plants; and in the natural method ranking under the fourth

order, gramina. The calyx is a bivalved gluma; the floscules of the female are fossile, and the male floscules are furnished with pedunculi; the female has no calyx; the corolla has a double valve; there is but one stylus, and one covered seed. The male has three stamina. There are three species, viz., A. aristata, A. mutica, and A. zugites, all natives of the Indies.

APLUSTRUM, the ancient ensign carried in sea vessels. It was sometimes used as an ornament for the frieze, the pediment, and porticoes of temples dedicated to Neptune.

APNŒA; from *α*, and *πνεω*, I breathe; in medicine, loss of respiration; used to denote the respiration when very small and slow, so as to seem quite gone, as is the case in the suffocation of the uterus, apoplexies, &c.

APO, a name given to an extensive shoal in the Indian Sea, lying between Mindoro and the Calamianes, and extending about twenty-eight miles from north to south, and eight from east to west. Long. 120° 36′ E., lat. 12° 27′ N.

APOBAMINA is used by chemists for a liquor wherein pieces of gold, heated red-hot, have been extinguished.

APOBATANA, the metropolis of Media, where the kings kept their treasure; supposed to be the same with Ecbatana.

APOBATERION; from *αποβαινω*, I depart; among the ancients, a farewell speech, or poem, made by a person on his departure out of his own country, or some other place where he had been kindly received and entertained. Such is that of Æneas to Helenus and Andromache, Æn. lib. iii.

APOBATHRA, a place near Sestos, the landing place where Xerxes's ships were frozen and stuck in the ice.

APOBATHRÆ, in antiquity, a kind of little bridges or stairs joining the land to ships, or one ship to another.

APOBEE, in botany, the name given by the natives of Guinea to a species of corn-marigold, called by Petiver chrysanthemum acaulon Guineense foliis longis angustis.

APOBOMIOI; from *απο*, below, and *βωμος*, altar; in antiquity, sacrifices offered on the bare earth without altars.

APOC'ALYPSE, APOC'ALYPTICAL, APOCALYP'TIC, *n.* & *adj.* } Αποκαλυψις; from *απο*, from, and *καλυπτω*, to cover, to conceal. Revelation, disclosure, manifestation. The last book of the sacred canon.

God the fadir seynge the tribulaciouns whiche hooli chirche was to suffre, that was founded of the apostlis on Crist, the stoon disposide the Sone and the Hooli Goost, to schewe hem that me drede hem the lesse, and al the trynyte schewide it Crist on the manheed, and Crist to ioon by an aungell, and ioon to hooli chirche, of which reuelacion ioon made this book, wherfore this book is reid *apocalips*, that is to seie, reuelacioun. *Wiclif. Pref. to Apocalips*, p. 143.

It was concluded by some, that Providence designed him the *apocalyptic* angel, which should pour out one of the vials of wrath upon the beast.

Spenser on Prodigies, p. 314.

If we could understand that scene, at the opening of this *apocalyptical* theatre, we should find it a representation of the majesty of our Saviour.

Burnet's Theory of the Earth.

The divine *apocalyptic* writing, after Jerusalem was ruined, might teach them what the second Jerusalem must be, not on earth, but from heaven.

Lightfoot's Miscellanies.

APOCALYPSE; from *αποκαλυπτω*, to reveal: Revelation, the name of the last of the sacred books of the New Testament, containing an account of the visions which John saw in the Island of Patmos, whither he had been banished by the emperor Domitian, or, as some suppose, by Nero. According to Irenæus, it was written about A. D. 96; but Sir Isaac Newton places the writing of it earlier. Some attribute this book to Cerinthus; but the ancients unanimously ascribe it to John the son of Zebedee, and brother of James, whom the Greek fathers call the Divine by way of eminence, to distinguish him from John the Baptist, &c. It has not at all times been esteemed canonical. There were many churches in Greece, as St. Jerome informs us, which did not receive it; neither is it in the catalogue of canonical books prepared by the council of Laodicea, nor in that of St. Cyril of Jerusalem; but Justin, Irenæus, Origen, Cyprian, Clemens of Alexandria, Tertullian, and all the fathers of the fourth, fifth, and the following centuries, quote the Revelation as then acknowledged to be canonical. The Alogians, Marcionites, Cerdonians, and Luther himself, rejected this book; but the Protestants have forsaken Luther in this particular; and Beza has strongly maintained against his objections, that the Apocalypse is authentic and canonical.

It is a strong reflection, doubtless, on the zeal or knowledge of modern Christians, that a book expressly entitled a 'Revelation,' should have been so variously interpreted by a large body of writers, and so often resigned to its supposed obscurity, in despair, by very able critics on other parts of Scripture. One of the latest and most learned of modern commentators on the New Testament says: 'I do not understand it; and in the things which concern so sublime and awful a subject, I dare not, as my predecessors, indulge in conjectures. I have read elaborate works on the subject, and each seemed right until another was examined. I am satisfied that no certain mode of interpreting the prophecies of this book has yet been found out; and I will not add another monument to the littleness and folly of the human mind, by endeavouring to strike out a new course. I repeat it: I do not understand the book; and I am satisfied that not one who has written on the subject knows any thing more of it than myself.'—*Dr. Adam Clarke's Comment.* Preface to the Revelations.

This is candid at any rate: yet does not this author in the least doubt the authenticity or inspiration of this book. So little indeed has it to fear from examination on this point, that Sir Isaac Newton long ago remarked, 'there is no other book of the New Testament so strongly attested;' and Dr. Priestley (no mean critic when his own peculiar sentiments were not concerned) has declared, he thinks it impossible for any intelligent and candid person to peruse it without being struck, in the most forcible manner, with the peculiar dignity and sublimity of its composition, superior to that of any other writings what-

ever; so as to be convinced that, considering the age in which it appeared, it could only have been written by a person divinely inspired. Of the external evidence of its authenticity, &c. the following is a brief summary. It is cited or plainly alluded to by the following writers in the apostolic age: Hermas, A. D. 100; Ignatius, A. D. 107 (as Dr. Woodhouse has lately shown); Polycarp, A. D. 108; Papias (perhaps) A. D. 116. By these writers of the second century: Justin Martyr, A. D. 140; Melito, bishop of Sardis, A D. 177; by the churches of Lyons and Vienne, A. D. 177; by Irenæus, A. D. 178; Athenagoras, A. D. 181; Apollonius, A. D. 186 or 187; Clement of Alexandria and Tertullian. In the third century by Hippolytus, Origen, Gregory of Neo-Cæsarea, Cyprian; the Novations, Commodian, Victorinus, Methodius, the later Arnobius. By the Donatists, Lactantius, and the Arians, in the fourth century; at the beginning of which period, in the time of Eusebius, its claims were disputed, principally on account of its internal difficulties. On this ground it seems to have been omitted in the catalogue of Cyril, bishop of Jerusalem, A. D. 340, and that of the council of Laodicea, A. D. 364; but in this century, and in the Greek church itself, it is supported by the testimonies of Athanasius, Basil, Epiphanius, Gregory of Nyssa, and Gregory Nazianzen. Thus, to borrow the elegant language of Bishop Woodhouse, 'We have seen its rise as of a pure fountain from the sacred rock of the apostolical church; we have traced it through the first century of its passage, flowing from one fair field to another, identified through them all, and everywhere the same. As it proceeded lower, we have seen attempts to obscure its sacred origin, to arrest or divert its course, to lose it in the sands of antiquity, or bury it in the rubbish of the dark ages. We have seen these attempts repeated in our own times, and by a dexterous adversary. But it has at length arrived to us, such as it flowed forth at the beginning. We may add that the reality of Christ's sufferings is explicity asserted (Rev. i. 5. v. 7) in conformity with the accounts of the evangelists, and the constant tenor of the New Testament. Whence it is evident, that the Apocalypse could not have been written by the heresiarch Cerinthus, as some early writers have asserted; for he maintained that Christ did not suffer, but only Jesus.'

There have been several other works published under the title of Apocalypses. Sozomen mentions a book used in the churches of Palestine, called the Apocalypse, or Revelation of St. Peter. He also mentions an Apocalypse of St. Paul; which the Cophtæ retain to this day. Eusebius also speaks of both these Apocalypses; St. Epiphanius mentions an Apocalypse of Adam; Nicephorus an Apocalypse of Esdras; Gratian and Cedrenus an Apocalypse of Moses, another of St. Thomas, and another of St. Stephen; St. Jerome an Apocalypse of Elias. Porphyry, in his life of Plotin, makes mention of the Apocalypses or Revelations of Zoroaster, Zostrian, Nicothæus, Allogenes, &c.

APOCARITES; from *αποκειρω*, I cut off; in ecclesiastical history, a sect that asserted that the human soul is part of, or derived from, the substance of God. They are ranked as a branch of the Manicheans.

APOCARPASUM, in natural history, a name given by the ancient Greeks to a poisonous drug, the exudation of a tree growing in the country of the Abyssines, and so much like the finest myrrh, that it was often mixed with it.

APOCATASTASIS; from *αποκαθιστημι*, I restore; denotes the entire restitution, or redintegration of a thing. In this sense, we read of the apocatastasis of the world; the apocatastasis of all things.

APOCATASTASIS, in astronomy, the period of the annual revolution of a planet, or the time wherein it returns to the same point of the zodiac from which it set out.

APOCATHARSIS, the same with catharsis, or expurgation.

APOCHA; from *απο*, and *εχω*, I have; in civil law, an acquittance, or receipt given by the creditor to his debtor for money paid, as distinguished from antapocha, which is given by the debtor to the creditor.

APOCHULISMA, APOCHYLISMA; from *απο*, and *χυλιζω*, I extract; in pharmacy, the inspissated juice of vegetables.

APOCLASM, in surgery, the same with abductio.

APOCOPE; from *απο*, and *κοπτω*, I cut; a figure in grammar, by which part of a word is cut off, as dic for dice, duc for duce.

APOCRISARIUS, or APOCRISIARIUS; from *αποκρισις*, answer; in antiquity, an officer appointed to deliver the messages, orders, and answers, of a prince or emperor. He was also the emperor's chancellor, and secretary for foreign affairs; the same with what Vopiscus calls notarius secretorum.

APOCRISIARIUS, in ecclesiastical history, the pope's deputy, who resided at Constantinople to receive the pope's orders, and the emperor's answer, and thus performed the office of the modern nuncio. St. Gregory was apocrisiary of pope Pelagius, when he composed his morals on Job. This office seems to have commenced when, the emperors being become Christians, foreign churches had more occasion to promote their suits at court. We find the office established by law in the time of Justinian. It was ordered that, as no bishop was to be long absent from his church without special command from the emperor, if any one had occasion to negociate any ecclesiastical cause at court, he should prefer his petition by the apocrisiarius of his church. Almost every monastery had its apocrisiarius likewise, whose business was to act as proctors for their monastery, or any member of it, when they had occasion to enter any appearance at law, before the bishop, under whose jurisdiction they were. The heresies of the Monothelites and the Iconoclasts broke off the custom of having a papal apocrisiary at Constantinople.

APOCRISIA, in physic, the ejection of superfluities out of the body.

APOCRISIS, *αποκρισις*, literally denotes an answer. Under this denomination were anciently included, not only the rescripts of the emperors to the petitions of parties, but all kinds of decrees or mandates. We have several books extant under the title of Apocrises.

APOC'RYPHA, APOC'RYPHAL, APOCRYPH'ICAL. } *Αποκρυφη*; from *απο*, and *κρυπτω*, to hide. A thing hidden from, concealed, secreted.

The other (bookes) folowynge, whiche are called *apocripha* (because they were wōt to be reade not openly and in commen, but as it were in secrete and apart) are neyther founde in the Hebrue nor in the Chalde. *Bible*, 1539. *Pref. to Apocripha.*

SHAT. This same duke is but
Apocryphal, there's no creation
That can stand where titles are not right.
Beau. and Fletch. Noble Gentleman, act iii.

Jerom (who saith that all writings, not canonical, are *apocryphal*) useth not the title *apocryphal*, as the rest of the fathers ordinarily have done; whose custom is, so to name (for the most part) only such, as might not publicly be read or divulged. *Hooker.*

To speak of her in the words of the *apocryphal* writers; wisdom is glorious, and never fadeth away. *Addison.*

APOCRYPHAL. Among the Romans the books of Sibyls were anciently called apocryphal, as being committed to the trust of the decemviri alone; and for the like reason the annals of the Egyptians and Tyrians were called by the same name.

Vossius observes with regard to the sacred books, none are to be accounted apocryphal except such as have been admitted neither into the synagogue nor the church, so as to be added to the canon, and read in public.

In the original meaning of the word, all the writings deposited in the temple were called apocryphal; because they were kept secret from the people.

When the Jews published their sacred books, they only gave the appellation of canonical and divine to such as they thus made public; and such as were still retained in their archives they called apocryphal, for no other reason but because they were not public; so that they might be really sacred and divine, though not promulged as such.

Hence in respect of the Bible, all works came to be called apocryphal which were not inserted in the Jewish canon of Scripture; and it is in this sense that St. Epiphanius is to be understood when he says, that the apocryphal books are not put in the ark among the other inspired writings. By the ark he is supposed to have meant not the ark of the covenant, but the common archives; for, according to Josephus, there was no ark in the second temple. Nevertheless, the sacred writings were locked up in the temple; and the apocryphal books were without doubt deposited in a distinct archive from that in which the canonical books were kept. To this purpose Tertullian, speaking of the book of Enoch, says, that some did not own it, 'quia nec in Judaicum armorium admittitur;' and St. Austin (de Civ. Dei, l. 15.) that the canonical books of the Old Testament were preserved in the Jewish temple by the carefulness of the priests, who succeeded one another. Hence it is probable that the holy books were lodged in the temple in one archive, and the apocryphal in another place.

The word itself, though of Greek original, cannot be explained by a Greek etymology, according to which it would convey a much higher idea, and signify writings preserved in the sacred recesses of the temple. It is rather a translation of the Rabbinical word גנוז, which signifies 'laid aside,' so as not to be read in the synagogue, e. g. if a copy of the Bible had two mistakes in one and the same page, it was allowable to correct them; but if there were three mistakes, the book must be laid aside (שלש יגנז), and they used the same expression for books which were not supposed to be of divine authority. However the terms גנוז, and *αποκρυφος*, though similar in their original meaning, are very different in their use and application. The word גנוז was applied to books divinely inspired, but we apply the term *αποκρυφος*, apocryphal, to those whose divine inspiration is denied. It is true that the ancient Jews made a distinction, which varied at various periods, between books that were to be read, and books that were not to be read in the synagogue, which latter the rabbin called גנוזים, but these were included in the sacred canon, whereas we apply the term apocryphal to those that are excluded from it; and this term, as applied by modern writers to such books as have relation to the New Testament, signifies in general 'spurious or supposititious,' and in this sense differs in a still higher degree from גנוז as applied to the books of the Old Testament. This term is applied by Jerome to books which by their title or otherwise make some claim to be a part of sacred Scripture, but are destitute of a right to be so esteemed; and generally, or oftentimes, they are spurious. It is necessary, however, to distinguish between the terms apocryphal and spurious: a spurious work is that which is ascribed to an author who did not compose it; and apocryphal, whether written by the author to whom it is ascribed or not, is used in much the same sense with uncanonical. Michaelis uses the term apocryphal for authentic, as distinguished from inspired; and merely in opposition to canonical; and he cautions against considering it as a term of contempt, or as depreciating a book to which it is applied. The exclusion, he says, of books called on this account apocryphal, from the canon, by no means derogates from their real worth; and although there are many under this title which are manifestly spurious, there are others again which are highly deserving our esteem. Apocryphal books, according to the definition of St. Augustine (Contr. Faust. l. xi. c. 2. and De Civ. Dei, l. 15. c. 23. n. 4.), are not such as are of authority (or received by the church), and are kept secret; but they are books whose original is obscure, and which are destitute of proper testimonials; their authors being unknown, or their character either heretical or suspected. The term apocryphal, which is variously used, is sometimes applied to those books that are not in the canon, (see CANON:) and of these there are two classes, viz. that of useful books, which may be read for the edification of the faithful, though doubtful and opposed, and that of the spurious pieces which are heretical and full of errors. Origen calls all the books which are out of the canon, apocryphal. Eusebius seems to use it for those books that

were composed by heretics, and which he distinguishes from those which are cited by ecclesiastical writers. Gregory Nazianzen, Athanasius, Epiphanius in the eighth Heresy, Ruffinus, and most of the modern Greeks, give the name apocryphal to such books only as are apparently spurious and wicked; and usually denominate those which are good and useful ecclesiastical, though they were not received by all the churches as canonical. On the other hand, Cyril, Epiphanius in his Treatise of Weights and Measures, Jerome, the African fathers, most of the Latins, and Antiochus among the Greeks, attribute the term apocryphal in general to all the books which are not in the canon. St. Austin distinguishes two sorts of canonical books; those which are received by all the churches, and those which are only received by some. Sixtus of Sienna likewise distinguishes them into two classes; the proto-canonical, which have been always received and were never questioned; and the deutero-canonical, which were formerly doubted, but have been since admitted into the canon. All the rest, according to this author, are apocryphal, though this term had been sometimes applied only to heretical books. Mr. Jones lays down the following criteria or tests, by which we may determine whether any books are apocryphal or spurious, or not. That book is apocryphal in which are found any contradictions,—which either contains any histories, or proposes any doctrines contrary to those which are certainly known to be true:—which contains things ludicrous or trifling, fabulous or silly relations:—which mentions facts that were later than the time in which the author, whose name it bears, lived:—the style of which is different from, or contrary to, the style of the author whose name it bears in his known and undoubted writings:—the idiom and dialect of which are different from the known idiom or dialect of the author whose name it bears, or the country where he lived:—which manifests a disposition in its author different from the known temper of the author whose name it bears:—and which for the most part is transcribed or stolen out of another.

The number of books in the Jewish canon was equal to the number of Hebrew letters, or twenty-two; and that this number might not be exceeded, the book of Ruth was joined to that of Judges, and the Lamentations to the prophecy of Jeremiah. The books, therefore, that were not contained in this number were excluded from the canon, and deemed apocryphal. The ancient catalogues of the canonical books of the Old Testament, which are to be met with in Christian writers, whether Greeks or Latins, are conformable to the canon of the Jews, and contain no other books: such are those of Melito bishop of Sardis, of Origen, of the council of Laodicea, Jerome, &c. &c. The first catalogue in which the books of Wisdom, Ecclesiasticus, Tobit, Judith, and the two Maccabees were admitted as canonical, and as having the same authority, is that of the third council of Carthage, A. D. 397, which confirms the decree of the council of Hippo, A. D. 393, in which these books were received into the canon. St. Augustine, according to the authority of the African church, reckons all these books as canonical. Pope Innocent I. on behalf of the church of Rome, places the same books in the canon of the Old Testament, as did also pope Gelasius in the council held A. D. 494; and moreover the decree of pope Eugenius, and the canon of the council of Trent, agree with the canon of the council of Carthage, and with the decree of pope Innocent, and rank the above-mentioned books among those of the Old Testament. See Ecclesiasticus, Judith, &c.

Among the books which have been wholly thrown out of the canon of holy scripture, we may mention a part of the book of Daniel, which the Jews rejected, containing the prayer of Azarias, and the song of the three children in the fiery furnace, which begin at the twenty-fourth verse of the third chapter, and end at the ninety-first: the history of Susanna, related in the thirteenth chapter; and of Bel and the Dragon, in the fourteenth and last. These are not in the Hebrew or Chaldee text, nor in the Greek version of the Septuagint, but are taken out of the Greek version of Theodotion, which was then used by the church, in Daniel's prophecy, as St. Jerome has observed. Theodoret, in his Exposition of Daniel, mentions neither the history of Susanna, nor that of Bel and the Dragon. However that which is related in these two chapters is cited under Daniel's name, and as part of his prophecy, by Irenæus, Clement of Alexandria, Tertullian, Origen, Cyprian, Didymus, Hilary, Basil, Gregory Nazianzen, Ambrose, Augustine, the author of a homily erroneously attributed to Chrysostom, Fulgentius, Avitus, and Bede. Sulpitius Severus, and the author of the Synopsis of Athanasius, mention these histories as part of the sacred text; though the latter owns that the history of Susanna is one of the dubious books. Ambrose quotes the words of Daniel, related in the third chapter, as being certainly of divine inspiration; and Ruffinus upbraids Jerome for having cut off from Daniel the song of the three children, the history of Susanna, and that of Bel and the Dragon. The council of Trent, (session four,) declared the following six books to be canonical, viz. Tobit, Judith, Wisdom, Ecclesiasticus, and the first and second of Maccabees; but joined Baruch with Jeremiah, so that the whole number amounts to seven. The apocryphal books enumerated in the sixth article of the church of England, are the third and fourth of Esdras, the book of Tobias, that of Judith, the rest of the book of Esther, that of Wisdom, that of Jesus the son of Sirach, Baruch the prophet, the Song of the Three Children, the Story of Susanna, of Bel and the Dragon, the prayer of Manasses, and the first and second books of Maccabees. These, by the same article, the church doth read for example of life and instruction of manners, but doth not apply them to establish any doctrine. Accordingly in the table prefixed to the Common Prayer, and appointing the lessons, they are directed to be read in the months of September, October, and November. It appears, however, that in the Common Prayer of Edward VI. there was for November 22nd and 23rd, no Bel and

Dragon, nor History of Susanna; but the order proceeded from Baruch to Jeremiah. The apocryphal books are prohibited in the other reformed churches. The Puritans, in the reign of queen Elizabeth, disliked and objected to the reading of these books in the church.

The spurious and apocryphal books, composed in the early days of Christianity, published under the names of our Saviour, his apostles, their companions, &c. and mentioned by the writers of the first four centuries, under the titles of gospels, epistles, acts, revelations, &c. are numerous. Most of them have been long lost, and some few are still extant, to which class belong our Saviour's letter to Abgarus; his letter, which fell down from heaven at Jerusalem, directed to a priest named Leopas, in the city Eris; the constitutions of the apostles; the creed of the apostles; the apostolical epistles of Barnabas, Clemens, Ignatius, and Polycarp; the shepherd of Hermas; the gospel of the infancy of our Saviour; the gospel of the birth of Mary; the prot-evangelion of St. James; the gospel of Nicodemus; the martyrdom of Thecla or acts of Paul; Abdias's history of the twelve apostles, or the acts of Pilate; St. Paul's epistle to the Laodiceans, and St. Paul's six letters to Seneca, &c.; the others, that are not extant, are enumerated by Mr. Jones. See *Jones's Canon*, vol. i. & ii. *Dupin's Complete History of the Canon*, &c. ch. i. *Lardner's Works* in various places. *Michaelis's Introd.* vol. i. p. 170. p. 376.

APOCYMA; from *απο*, and *κυμα*, wave; in antiquity, a name given by Greek authors to a sort of cement, used to daub over the bottoms of their ships, to preserve them from the water; also called zopissa. It was a mixture of bees-wax and pitch melted together, and, after it had been soaked some time in the sea-water, it was supposed to have peculiar virtues, and was used in many compositions.

APOCYNUM, Αποκυνον; of *απο*, and *κυνος*, a dog; because the ancients believed this plant would kill dogs. Dogsbane: A genus of the digynia order, and pentandria class of plants; natural order thirtieth, contortæ. The essential characters are: COR. is bell-shaped; and the filaments are five, alternate with the stamina. Of this genus botanical writers enumerate eleven species; of which the following are the most remarkable: 1. A. cordatum has a climbing stalk, and was discovered with the villosum, at La Vera Cruz in New Spain, by Dr. William Houstoun, who sent their seeds to England. They are both climbers and mount to the top of the tallest trees. The cordatum has produced flowers several times; but the villosum never showed an appearance of any. 2. A. speciossimum, the savannah flower, has large flowers, and is a native of Jamaica and of Savannah. It rises three or four feet high, having woody stalks which send out a few lateral branches, garnished with smooth oval leaves, placed by pairs opposite, of a shining green color on the upper sides, but pale and veined underneath. The flowers are produced from the sides of the branches, upon long foot-stalks: there are commonly four or five buds at the end of each; but there is seldom more than one of them which comes to the flower. The flower is very large, having a long tube which spreads open wide at the top, of a bright yellow, and makes a fine appearance, especially in those places where the plants grow naturally, being most part of the year in flower. 3. A. venetum has an upright herbaceous stalk, and grows on a small island in the sea near Venice, but is supposed to have been originally brought from some other country. There are two varieties of this; one with a purple, and the other with a white flower. The roots creep very much, and by them only it is propagated; for it seldom produces any seeds either in the gardens where it is cultivated, or in those places where it grows naturally. The stalks rise above two feet high, and are garnished with smooth oval leaves placed opposite; the flowers grow at the top of the stalks, in small umbels, and make a very pretty appearance. The flowers appear in July and August. This species is hardy enough to live in England in the open air, provided it is planted in a warm situation and dry soil. The best time for removing and planting its roots is in spring, just before they begin to push out new stalks. 4. A. villosum, a native of Vera Cruz. This and the two first species are propagated by seeds, but are so tender as to require being kept constantly in a stove.

All the species of the apocynum abound with a milky juice, which flows out from any part of their stalks and leaves when they are broken; this is generally supposed to be hurtful if taken inwardly, but does not blister the skin when applied to it, as the juice of spurge and other acrid plants do. The pods of all the sorts are filled with seeds, which are for the most part compressed and imbricated; these have each a long plume of a cottony down fastened to their crowns, by which, when the pods are ripe and open, the seeds are wafted by the wind to a considerable distance, so that the plants become very troublesome weeds. This down is in great esteem in France, for stuffing of easy chairs, making of quilts, &c.; for it is exceedingly light and elastic. It is called by the French delarrad; and might probably become a vendible commodity in England, were people attentive to the collecting of it in Jamaica where the plants are found in plenty.

APODACRYTICA; from *απο*, and *δακρυ*, a tear; in pharmacy, medicines to excite tears, and carry off superfluous humors from the eyes.

APODECTÆ; from *αποδεχομαι*, I receive; in antiquity, a denomination given to ten general receivers, appointed by the Athenians to receive the public revenues and taxes. The apodectæ had also a power to decide controversies arising in relation to money and taxes; but there was an appeal to the courts of judicature.

APODECTÆI, in the Athenian government, officers appointed to see that the measures of corn were just.

APODES; from *α*, and *πους*; in a general sense, denotes things without feet. Zoologists apply the name to a fabulous sort of birds, said to be found in some of the islands of the New World, which, being entirely without feet, support themselves on the branches of trees by their crooked bills. The Germans and Dutch have also their apodes, a sort of birds, somewhat like

swallows, whose legs and feet are so very small, that they seem rather formed for creeping than running.

APODES, in the Linnæan system, the name of the first order of fishes, or those which have no belly fins. See ZOOLOGY.

APODIOXIS, in logic; from *αποδιωκω*, to exclude; the rejection of such things as do not necessarily belong to the question to be considered.

APODIOXIS, in rhetoric, a figure whereby we either pass over a thing slightly, or refer treating of it to some other time or place. It is called by Latin writers, rejectio; e.g. Quid ego senatum defendam, judices? Equidem debeo, &c.

APODIX'IS, APODIC'TICAL, APODIC'TIC. *Αποδεικνυμι*; *απο*, and *δεικνυμι*, *δειξω*, to show, to manifest, to demonstrate. Manifestation, demonstration.

Holding an *apodictical* knowledge, and an assured knowledge of it; verily, to persuade their apprehensions otherwise were to make an Euclid believe, that there were more than one centre in a circle.

Brown's Vulgar Errors.

'We can say all, at the number three; therefore the world is perfect.' 'Tobit went, and his dog followed him, therefore there is a world in the moon,' were an argument as *apodictical*. *Glanville.*

There's no *apodictical* argument to prove, that any particular man will die; but yet he must be more than man who can presume upon immortality here, when he finds so many generations already gone to a man. *Wollaston's Religion of Nature.*

APODIXIS, in writers of the middle age, a receipt for money paid.

APODOSIS; from *αποδιδωμι*, I apply; in rhetoric, makes the third part of a complete exordium, being properly the application, or restriction of the protasis. The apodosis is the same with what is otherwise called axiosis, and stands opposed to protasis. Apodosis is also used, in speaking of similes, for that part which makes the application of them.

APODYTERIUM; from *αποδυειν*, to undress; in antiquity, an apartment at the entrance of baths, wherein persons dressed and undressed.

APOGEE; from *απο*, from, and *γη*, the earth; a point in the heavens, in which the sun, or a planet, is at the greatest distance possible from the earth in its whole revolution. The ancient astronomers, regarding the earth as the centre of the system, chiefly regarded the apogæon and perigæon, which the moderns, making the sun the centre, change for the aphelion and perihelion.

APOGRAPHE; from *απο*, and *γραφω*, to write; a copy or transcript of some book or writing. Apograph stands opposed to autograph, as a copy to an original.

APOGRAPHE, in ancient law, was, when a person being sued for money, supposed due to the public, pleaded that the charge was unjust, and produced his accounts.

APOGRAPHE, or APOGRAPHON, in the Roman law, was used to denote a catalogue, or inventory of goods.

APOLDA, a town and bailiwick of Saxony, in Thuringia, four miles from Jena. It belonged in former times to the Vitzthum family, but in 1631 it became the property of the duke of Saxe-Weimar, who gave it to the university of Jena, which now exercises the sole jurisdiction.

APOLEPSIS; from *απολαμβανω*, I retain; in the ancient physic, the tying a vein or artery to stop an hæmorrhage.

APOLEPSIS; from *απολειπω*, I leave; in the Athenian law, an action of divorce; brought when a woman had fled from her husband.

APOLIDES, in antiquity; from *α*, negative, and *πολις*, a city; persons condemned for life to the public works, or exiled into some island, and thus divested of the privileges of Roman citizens.

APOLLINARES LUDI, in antiquity, a general name given to all scenical games. They were also called ludi liberales, and scenici. They differed from the ludi theatrales, in that the former were celebrated with all sorts of plays, farces, poems, recitations, &c. the latter only by dancing and music. This kind of Apollinarians had their share in almost all the solemn games. See next article.

APOLLINARIAN GAMES, in Roman antiquity, were instituted in the year of Rome 542. The occasion was a kind of oracle, delivered by the prophet Marcus, after the fatal battle at Cannæ, declaring that, to expel the enemy, and cure the people of an infectious disease, which then prevailed, sacred games were to be annually performed in honor of Apollo; the prætor to have the direction of them, and the decemviri to offer sacrifices after the Grecian rite. The senate ordered that this oracle should be observed the rather, because another prophecy of the same Marcus, wherein he had foretold the overthrow at Cannæ, had come true; for this reason they gave the prætor 12,000 ases out of the public funds, to defray the solemnity. There were sacrificed an ox to Apollo, and two white goats and a cow to Latona; with their horns gilt. Apollo had also a collection made for him, besides what the people, who were spectators, gave voluntarily. The first prætor by whom they were held was P. Cornelius Sylla. For some time they were movable or indictive; but at length were fixed, under P. Licinius Varus, to the fifth of July, and made perpetual. The men, who were spectators at these games, wore garlands on their heads; the women performed their devotions in the temples at the same time; and at last they caroused together in the vestibules of their houses, the doors standing open. The Apollinarian games were merely scenical; and at first only observed with singing, piping, and other sorts of music; but afterwards, there were also introduced all manner of mountebank tricks, dances, and the like; yet so as that they still remained scenical, no chariot races, wrestling, or the like laborious exercises of the body, being ever practised.

APOLLINARIANS, or APOLLINARISTS, called also by Epiphanius DIMÆRITÆ, ancient heretics, who denied the proper humanity of Christ, and maintained that the body which he assumed was endowed with a sensitive, and not a rational, soul, but that the divine nature supplied the place of the intellectual principle in man. This sect derived its name from Apollinaris, bishop of Laodicea. The Apollinarians have been charged with other opinions, such as the Milleuarian and Sabellian, the pre-existence of

the body of Christ, and the passion of his deity; but ecclesiastical writers are not agreed with respect to these and other particulars. Their doctrine was first condemned by a council of Alexandria in 362, and afterwards in a more formal manner by a council at Rome in 375; and by another council in 378, which deposed Apollinaris from his bishopric. Notwithstanding all these censures, his doctrine spread through most of the churches of the east; and his followers were subdivided into various sects. In 388 the emperor Theodosius enacted a law, forbidding them to hold assemblies, to have any ecclesiastics or bishops, or to dwell in cities. The rigorous execution of this law, in concurrence with the decrees of different councils, reduced them to a very small number, and their doctrine and sect at length dwindled away.

APOLLINARIS, a bishop of Laodicea, in the fourth century, who was deposed for his heretical opinions, A. D. 378. See last article.

APOLLINARIS (Caius Sulpicius), a very learned grammarian, born at Carthage, lived in the second century under the Antonines; he is supposed to be the author of the verses which are prefixed to the comedies of Terence, and contain the arguments of them. He had for his successor, in the profession of grammar, Helvius Pertinax, who had been his scholar, and was at last emperor.

APOLLINARIS SIDONIUS (Caius Lollius), an eminent Christian writer and bishop in the fifth century, was born of a noble family in France. He was educated under the best masters, and made a prodigious progress in the several arts and sciences, and particularly in poetry and polite literature. After he had left the schools he applied himself to the profession of war. He married Papianilla the daughter of Avitus, who was consul and afterwards emperor, by whom he had three children. But Majorianus, in the year 457, having deprived Avitus of the empire, and taken the city of Lyons, in which our author resided, Apollinaris fell into the hands of the enemy. However, the reputation of his learning softened Majorianus's resentments, so that he treated him with the utmost civility, in return for which Apollinaris composed a panegyric to his honor; which was so highly applauded that he had a statue erected to him at Rome, and was honored with the title of Count. In the year 467 the emperor Anthemius rewarded him for the panegyric, which he had written in honor of him, by raising him to the post of governor of Rome, and afterwards to the dignity of a patrician and senator, and erecting a statue to him. But he soon quitted these secular employments for the service of the church. The bishopric of Clermont being vacant in 472, by the death of Eparchus, Apollinaris, who was then only a layman, was chosen to succeed him without any interest or solicitation on his part, in which see he acted with the greatest integrity. Clermont being besieged by the Goths, he animated the people to the defence of that city, and would never consent to the surrender of it; so that when it was taken, about the year 480, he was obliged to retire; but he was soon restored by Evariges king of the Goths, and continued to govern the church as he had done before. He died in 487; and his festival is still observed in the church of Clermont, where his memory is had in great veneration. He is esteemed the most elegant writer of his age, both in prose and verse. He wrote a great many minor pieces; but preserved only those which he thought were worthy of being continued down to posterity. He collected, himself, the nine books which remain of his letters.

APOLLINARIUS (Claudius), a learned bishop of Hierapolis, who, about the year 170, presented to Marcus Aurelius an excellent apology for the Christians.

APOLLINARIUS (the Younger), thus called to distinguish him from his father, was at first lector or reader of Laodicea, and afterwards bishop of that city. He wrote a treatise against paganism which he sent to the emperor Julian, who returned it, saying, 'I have read, understood, and condemned;' to which the bishop replied, 'You may have read, but cannot have understood, or you would not have condemned.'

APOLLO, in mythology, a pagan deity, worshipped by the Greeks and Romans. Cicero mentions four of the name: the most ancient of whom was the son of Vulcan; the second a son of Corybas, and born in Crete; the third an Arcadian, called Nomian, from his being a legislator; and the last, to whom the greatest honor is ascribed, the son of Jupiter and Latona. Apollo had a variety of other names, either derived from his principal attributes, or the chief places where he was worshipped. He was called the Healer, from his enlivening warmth and cheering influence; Pæan, from the pestilential heats; Nomius, or the shepherd, from his fertilising the earth, and thence sustaining the animal creation; Delius, from his rendering all things manifest; Pythius, from his victory over Python; Lycias, Phœbus, and Phaneta, from his purity and splendor. Whether Apollo was ever a real personage, or only the great luminary, many have doubted. Vossius has taken great pains to prove this god to be only a metaphorical being, and that there never was any other Apollo than the sun. 'He was styled the son of Jupiter,' says this author, 'because that god was reckoned by the ancients the author of the world. His mother was called Latona, hidden; because, before the sun was created, all things were wrapped up in the obscurity of chaos. He is always represented as beardless and youthful, because the sun never grows old or decays.' It appears, however, from many passages in ancient authors, that there was some illustrious personage named Apollo who, after his apotheosis, was taken for the sun. Of the four Apollos mentioned by Cicero, it appears that the three last were Greeks, and the first an Egyptian; who, according to Herodotus, was the son of Osiris and Isis, and called Orus. Pausanias is of the same opinion as Herodotus, and ranks Apollo among the Egyptian divinities. The testimony of Diodorus Siculus is still more express; for in speaking of Isis, after saying that she had invented the practice of medicine, he adds, that she taught this art to her son Orus, named Apollo, who was the last of the gods that reigned in Egypt.

The musical contests of this god must not be wholly unnoticed. His contest with Pan is among the most celebrated. Pan, who thought he excelled in playing the flute, offered to prove that it was an instrument superior to the lyre of Apollo. The challenge was accepted; and Midas, who was appointed the umpire in this contest, deciding in favor of Pan, was rewarded by Apollo, according to the poets, with the ears of an ass, for his stupidity. This fiction seems founded upon history. Midas, according to Pausanias, was the son of Gordius and Cybele; and reigned in the Greater Phrygia, as we learn from Strabo. He was possessed of such great riches, and such an inordinate desire of increasing them by the most contemptible parsimony, that, according to the poets, he converted whatever he touched into gold. However, his talent for accumulation did not extend to the acquirement of taste and knowledge in the fine arts; and, perhaps, his dulness and inattention to these provoked some musical poets to invent the fable of his decision in favor of Pan against Apollo. The scholiast upon Aristophanes, to explain the fiction of his long ears, says, that it was designed to intimate that he kept spies in all parts of his dominions. Marsyas, another player on the flute, was still more unfortunate than either Pan or his admirer Midas. Having engaged in a musical dispute with Apollo, he chose the people of Nysa for judges. Apollo played at first a simple air upon his instrument; but Marsyas, taking up his pipe, struck the audience so much by the novelty of its tone, and the art of his performance, that he seemed to be heard with more pleasure than his rival. Having agreed upon a second trial of skill, the performance of Apollo, by accompanying the lyre with his voice, was allowed greatly to excel that of Marsyas upon the flute alone. Marsyas, with indignation, protested against the decision of his judges; urging that he had not been fairly vanquished according to the rules stipulated, because the dispute was concerning the excellence of their several instruments, not their voices; and that it was wholly unjust to employ two powers against one. Apollo denied that he had been any unfair advantages of his antagonist, since Marsyas had employed both his mouth and fingers in performing upon his instrument; so that, if he was denied the use of his mouth, he should be still more disqualified for the contention. The judges approved of Apollo's reasoning, and ordered a third trial. Marsyas was again vanquished; and Apollo, inflamed by the violence of the dispute, flayed him alive for his presumption. Pausanias says that Apollo accepted the challenge from Marsyas, upon condition that the victor should use the vanquished as he pleased. Diodorus informs us, that Apollo, not repenting of the cruelty with which he had treated Marsyas, broke the strings of the lyre, and by that means put a stop for a time, to any further progress in the practice of that new instrument. Possibly the fable of Marsyas might originate from some musician of that name, who, by too frequent and violent exertions upon a flute, or other wind instrument, might have hurt his constitution, especially in a hot climate, and thus, by a gradual decay, have reduced himself to mere skin and bone. The next important incident mentioned in the history of Apollo, is his defeat of the serpent Python. The waters of Deucalion's deluge, which had overflowed the earth, left a slime, from whence sprung innumerable monsters; and among others the serpent Python, which made great havoc in the country about Parnassus. Apollo, with his darts, put him to death; which, physically explained, implies, that the heat of the sun having dissipated the noxious streams, those monsters soon disappeared: or, if this fable be referred to history, the serpent probably was a robber, who, haunting the country about Delphos, and very much infesting those who came thither to sacrifice; one of the priests of that god put him to death. This legend gave rise to the institution of the Pythian games, so frequently mentioned in the Grecian history; and it was from this, that the god himself was named Pythius, and his priestess Pythia. As Apollo was the god of the fine arts, those who cultivated them were called his sons. Of this number was Philammon of Delphos, whom the poets and mythologists make the twin brother of Autolychus, both sons of the nymph Chione, but by different fathers. Philammon, a great poet and musician, was reported to be the offspring of the god who presides over those arts; and Autolychus, from the craftiness and subtlety of his disposition, was said to have sprung from Mercury, the god of theft and fraud. Philammon is one of the first, after Apollo, upon fabulous record, as a vocal performer, who accompanied himself with the sound of the lyre: his son was the celebrated Thamyras. The wolf and hawk were consecrated to Apollo, as symbols of his piercing eyes; the crow and the raven, because these birds were supposed to have the faculty of prediction; the cock because by his crowing he announces the rising of the sun; and the grasshopper on account of his singing all summer without food, like those men who, dedicating themselves to the Muses, forget the common concerns of life. The swan was regarded by the ancients as a bird sacred to Apollo; first, as being gifted with the spirit of prediction, and, secondly, for his extraordinary vocal powers; the sweetness of whose song, especially at the approach of death, was extolled by the ancient poets.

Apollo Belvidere, one in the first class of the ancient statues. The excellence of this statue consists in the expression of something divine, whereas the rest excel only in things that are common to men. This statue may perhaps justly claim the preference, even in the superior and distinguished class of the best remains of all antiquity. There are about twenty ancient statues which the moderns have discovered that are referred to the last class, and considered each as the chief beauty in its kind.

APOLLODORUS, a celebrated grammarian of Athens, the son of Asclepiades and disciple of Aristarchus. He wrote many works not now extant; but his most famous production was his Bibliotheca, concerning the origin of the gods. The work consisted of twenty-four books, but only three are now extant.

APOLLODORUS, a famous painter of Athens, who, about A.A.C. 408, invented the art of mingling colors, and of expressing lights and shades. He was admired also for his judicious choice of subject; and for the beauty and strength of coloring surpassed all the masters that went before him.

APOLLODORUS, a native of Damascus, an eminent architect under Trajan and Adrian. He had the entire direction of the bridge of stone which Trajan ordered to be built over the Danube, A.D. 104, which was esteemed the most magnificent of the works of that emperor. When Trajan was once discoursing with this architect upon the buildings he had raised at Rome, Adrian offered his judgment, and showed that he understood nothing of the matter. Apollodorus bluntly said to him, 'Go paint citruls, for you understand nothing of the subject we are talking upon. Adrian at this time boasted of his skill in painting citruls. When Adrian sent him the design of a temple of Venus, which he had just built, the architect observed, that it was too small for the size of the statues, and said, 'that if the goddess should wish to rise and go out, she could not.' This freedom afterwards cost Apollodorus his life.

APOLLON, an instrument of the lute species, with twenty springs, invented in 1678 by M. Promt.

APOLLONIA, feasts sacred to Apollo, instituted upon the following occasion: Apollo, having vanquished Python, went with his sister Diana to Ægialea; but, being driven from thence, they removed to the island Crete. The Ægialeans were soon after visited with a plague; upon which, consulting the soothsayers, they were ordered to send seven young men and as many virgins, to appease these deities and bring them back into their country. Apollo and Diana being thus appeased, returned to Ægialea: in memory of which they dedicated a temple to Pitho, the goddess of persuasion; whence a custom arose of choosing every year seven young men, and as many virgins, to go as it were in search of Apollo and Diana.

APOLLONIA, the name of a colony of the Milesians in Thrace, from which Lucullus took away a colossus of Apollo, and placed it in the capitol. The greatest part of the town was situated in a small island on the Euxine, in which was a temple of Apollo. Pliny says the colossus was thirty cubits high, and cost 500 talents.

APOLLONIA, an English fort in the kingdom of Amanhea, on the Gold Coast of Africa, about twenty-eight miles east of the river Ancobra. It is the fourth or fifth of our establishments on this coast in point of importance, being maintained at an annual expense of about £900. Apollonia seems formerly to have been the name of a native kingdom here.

APOLLONIAN HYPERBOLA, and PARABOLA, &c. See HYPERBOLA, PARABOLA, &c.

APOLLONICON, a celebrated organ, constructed by Messrs. Flight and Robson, with cylinders of considerable magnitude. In this instrument are also five rows of keys, placed lengthways fronting the proscenium.

APOLLONIUS, author of the Argonautics, surnamed the Rhodian, from the place of his residence, is supposed to have been a native of Alexandria, where he is said to have recited some portion of his poem while yet a youth. Finding it ill received by his countrymen, he retired to Rhodes; where he is conjectured to have polished and completed his work, supporting himself by the profession of rhetoric, and receiving from the Rhodians the freedom of their city. He at length returned to the place of his birth, and succeeded Eratosthenes in the care of the Alexandrian library, in the reign of Ptolemy Euergetes, about A.A.C. 246. That prince had been educated by the famous Aristarchus, and rivalled the preceding sovereigns of his liberal family in the munificent encouragement of learning. Apollonius was a disciple of the poet Callimachus; but their connexion ended in the most violent enmity, which was probably owing to some degree of contempt expressed by Apollonius for the light compositions of his master. The only work of Apollonius which has descended to modern times is his poem above mentioned, in four books, on the Argonautic expedition. The ancient scholia upon his Argonautics, still extant, are extremely useful, and full of learning. The best editions of his poems are those of Oxford, 2 vols. 4to. 1777, and of Brunck, in 12mo. Henry Stephens published an edition in 1574, 4to.; it has been translated into English verse by Dr. Ekins, late dean of Carlisle, and by the late W. Preston, Esq.

APOLLONIUS of Perga, in Pamphylia, a great geometrician, under Ptolemy Euergetes, from the 133d Olympiad to the 139th. He studied at Alexandria, under the disciples of Euclid; and composed several works, of which that only of the Conics remains, which was first published by Commandinus at Bologna in 1566. Dr. Halley gave a noble edition in 1710 at Oxford, in folio.

APOLLONIUS, of Tyana in Cappadocia, a Pythagorean philosopher, who flourished about the beginning of the first century. At sixteen years of age he became a strict observer of the rules of Pythagoras, renouncing wine and flesh, letting his hair grow, and wearing nothing but linen. He soon after set up for a reformer of mankind, and chose his habitation in a temple of Æsculapius, where he is said to have performed many wonderful cures. Philostratus has written the life of Apollonius, in which there are numberless fabulous stories recounted of him, too numerous and too ridiculous to be inserted in a work of this description. The heathens were fond of opposing the pretended miracles of this man to those of our Saviour; and by a treatise which Eusebius wrote against one Hierocles, we find that the drift of the latter, in the treatise which Eusebius refutes, seems to have been to draw a parallel betwixt Jesus Christ and Apollonius, in which he gives the preference to this philosopher. M. Dupin has written a confutation of Philostratus's life of Apollonius. Apollonius wrote four books of judicial astrology; a treatise upon the sacrifices, showing what was proper to be offered to each deity; and a great number of letters; all of which are now lost.

APOLLONIUS (Dyscolus, or the Lean), a gram-

marian of Alexandria, in the second century. He wrote in Greek a book on syntax, which was printed first at Venice in 1495, and afterwards at Frankfort in 1590. There is likewise ascribed to him a collection of historical curiosities, printed at Basil in 1568, and at Leyden in 1620.

APOLLONIUS, a christian martyr of the second century. He was a member of the Roman senate, and a man of great eloquence and learning.

APOLLONIUS, a stoic philosopher of Chalcis, who, coming to Rome, was sent for by the emperor Antoninus Pius, to be preceptor to Marcus Aurelius, on which the philosopher rudely said, that it was the place of the scholar to wait on the master, and not the master on the scholar. The emperor mildly observed, that he was surprised Apollonius should find it farther from his lodgings to the palace than from Chalcis to Rome.

APOLLOS, in Scripture history, a Jew of Alexandria, who came to Ephesus during the absence of St. Paul, who was gone to Jerusalem (Acts xviii. 24), and who is described as an eloquent man, well versed in the Scriptures.

APOLLYON, a Greek word that signifies the destroyer, and answers to the Hebrew Abaddon. Revelations ix. 11. See ABADDON.

APOLOGETIC, in literary history, the title of a work of Tertullian, of great strength and spirit.

AP'OLOGUE, AP'OLOGUER. } For derivation see APOLOGY. A fable or tale invented and related to enforce or explain moral truths.

An *apologue* of Æsop is beyond a syllogism; and proverbs more powerful than demonstration.

Brown's Vulg. Errors.

Some men are remarked for pleasantness in raillery; others for *apologues*, and apposite diverting stories. *Locke.*

A mouse (saith an *apologer*) was brought up in a chest; there fed with fragments of bread and cheese, thought there could be no better meat, till coming forth at last, and feeding upon a variety of other viands, loathed his former life.

Burton's Anatomy of Melancholy.

APOL'OGY, APOL'OGISER, APOL'OGIST, APOL'OGISE, APOLOGET'ICAL, APOLOGET'IC. From απολογεω, or απολογιξομαι; απο, and λεγω, to say. To reply, in order to vindicate, to excuse, to defend, justify, to plead in favor of.

For in ye booke that is called mine *apology*, it is not required by the nature of that name, that it be any aunswere or defence for mine owneselfe at all, but it sufficeth that it be of mine owne making an aunswere or defence for some other.

Sir Thos. More's Workes, fol. 932. ch. i.

It is not my intention to make an *apology* for my poem: some will think it needs no excuse; and others will receive none. *Dryden.*

I shall neither trouble the reader nor myself, with any *apology* for publishing of these sermons: for, if they be (in any measure) truly serviceable to the end for which they are designed, I do not see what *apology* is necessary; and if they be not so, I am sure none can be sufficient. *Tillotson.*

In her face excuse
Came prologue, and *apology* too prompt;
Which, with bland words at will, she thus address'd.
Milton.

The translator needs not *apologize* for the choice of this piece, which was made in his childhood.

Pope's Preface to Statius.

I design to publish an essay, the greater part of which is *apologetical*, for one sort of chymists. *Boyle.*

But for this practice (detraction), however vile, some have dared to *apologize*, by contending that the report by which they injured an absent character was true. *Hawkesworth.*

APOLOGY has therefore the sense of refutation, and of defence, generally. Although Christianity is in itself so excellent as, properly speaking, to require no apology, yet the infidelity and wickedness of mankind have rendered apologies for it necessary in all ages since its first appearance, and in none perhaps more than in the present. The principal ancient apologies in favor of the Christians are those of Quadratus, written about the year 124, and addressed to the emperor Adrian; of Aristides, written soon after the former; two of Justin Martyr, one of which was written in the year 150, and addressed to Antonine, and the other in 166, addressed to the Roman senate; one of Athenagoras, to the emperors M. Aurelius and Lucius Verus; the apologetic of Tertullian; and the dialogue of Minutius Felix, called Octavius, written in the third century. It would be endless to enumerate the various works which have been published in modern times, that might be classed under this title. Robert Barclay's Apology for the People 'in scorn called Quakers,' is one of the most celebrated; but the last and best perhaps that expressly bear it are the late bishop of Landaff's Apology for Christians, addressed to Gibbon; and his Apology for the Bible, in a series of letters addressed to Thomas Paine.

APOLUSIS, or APOLYSIS; from απολυω, I release; in a general sense, the solution, or resolution of any thing. Thus we read of the apolusis of a disease, the apolusis of a bandage, or the like. Apolusis, in a more particular sense, denotes the exclusion of any thing. Thus we read of the apolusis of the fœtus, the fecundines, and the like.

APOMECOMETRY; απο, from, μηκος, distance, and μετρεω, to measure; the art of measuring things at a distance.

APOMELI, among ancient physicians, a decoction of honey and vinegar, much used as a detergent promoter of stool, urine, &c. among the Greeks.

APOMYOS DEUS; from απο, and μυια, fly; in the heathen mythology, a name under which Jupiter was worshipped at Elis, and Hercules, as well as Jupiter, at the Olympic games. These deities were supplicated under this name, to destroy or drive away the vast number of flies which always attended at the great sacrifices. The usual sacrifice was a bull.

APONEUROSIS, in surgery; from απο, from, and νευρον, a nerve; an expansion of a nerve into a membrane. Aponeurosis is also used for the cutting off a nerve; and sometimes for the tendon itself.

APONEUROTICUS MUSCULUS, in anatomy, a name given by Spigelius, and some others, to a muscle of the thigh, called by Cowper and Winslow the musculus lati tendinis, and musculus fasciæ latæ. Winslow has called it, with

more propriety, the tensor vaginæ femoris. See ANATOMY.

APONIA; from *a*, and *πονος*, labor; among physicians, a state of indolence, or the absence of pain. In which sense the word amounts to the same with anodynes. Hence, also, aponia is used by some for medicines which do not excite pain.

APONO (Peter d'), one of the most famous philosophers and physicians of his age (the thirteenth century), born in a village about four miles from Padua. He studied some time at Paris. When he came to practise as a physician, he is said to have insisted on very large sums for his visits. It is affirmed that he would not attend the sick from home under 150 florins a-day; and when he was sent for by Pope Honorius IV. he demanded 400 ducats for each day's attendance. Being suspected of magic, he was prosecuted by the Inquisition on that account. 'The common opinion of almost all authors,' says Naude, 'is, that he was the greatest magician of his age; that he had acquired the knowledge of the liberal arts, by means of the seven familiar spirits, which he kept enclosed in a crystal; and that he had the dexterity to make the money he had spent come back into his purse!' The same author adds, that he died before the process against him was finished, being then in the 80th year of his age; and that, after his death, he was burnt in effigy, in the public place in the city of Padua; his body was ordered to be disinterred, and burnt; but a female servant contrived to have it removed to another church during the night-time. Among his works were, 1. 'Conciliator Differentiarum Philosophorum et præcipue Medicorum, Venet. 1471. 2. De Venenis, eorumque Remediis. 3. Expositio Problematum Aristotelis, 4to. Mant. 1475. 4. La Fisionomie du Conciliator Pierre de Apono, 8vo. Padua, 1474. 5. Hippocrates de Medicorum Astrologia Libellus, from the Greek into Latin, 4to. Venet. 1458. 6. Quæstiones de Febribus, 1482, Patav.; a manuscript in the Imperial library. 7. Geomantia, 8vo. Venet. 1549. &c.

APONOGETON, in botany, a genus of plants of the class dodecandria, tetragynia. Natural order, inundatæ; naiades, Jussieu. General character: CAL. none, except a spathaceous scale surrounding the flower: COR. none: STAM. filaments eleven to nineteen, in the upper flowers fewer, inserted between the spathe and the capsules, subulate, smooth, white, many times shorter than the spathe: PIST. germ usually four: STYL. none: STIG. subulate, bent inwards: PER. capsules four, seldom three or five, ovate, subulate, acute, gibbous on the outside, flat on the inner side, smooth, one-celled: SEEDS, three in each capsule, attached to its base. Essential general character: CAL. an amentum: COR. none: CAPS. three-seeded. The species are: 1. A. monostachyon, single-spiked aponogeton: spike simple. Observed by Koenig to be common in the fields of the East Indies that are flooded for rice. 2. A. distachyon, broad-leaved aponogeton: spike bifid. Thunberg found it in brooks at the Cape of Good Hope, whence it was introduced here by Mr. F. Masson in 1788. 3. A. angustifolium, narrow-leaved aponogeton: spike bifid. It flowers during the greatest part of the year.

APONUS, a fountain and village near Patavium in Italy, now Abano. The waters were hot and salutary in cases of disease, as we learn from an idyl of Claudian. Lucan, (lib. 7, ver. 193,) also alludes to it,

> Euganeo, si vera fides memorantibus, Augur
> Colle sedens, Aponus terris ubi fumifer exit,
> Atque Antenorei dispergitur unda Timavi.

This place was encircled with walls by order of Theodoric, king of the Goths. *Suet. in Tiber.* 14. *Sil.* lib. 12, ver. 18.

APOPEMPTIC; from *αποπεμπω*, to dismiss; in the ancient poetry, a hymn addressed to a stranger on his departure from a place to his own country; or to the gods, as supposing them returning each to his own country. Hence it was, that among the Delians and Milesians we find feasts of Apollo, and among the Argians feasts of Diana, called Epidemiæ, as supposing these deities then more peculiarly resident among them. On the last day of the feast they dismissed them, following them to the altars with apopemptic hymns.

APOPHASIS. A figure of rhetoric, in which a brief allusion is made to a thing which we decline to speak of fully and distinctly. Also, a term in civil law.

APOPHASIS BONORUM, in antiquity, an inventory, or properly an account taken of estates when they were exchanged, in order to avoid public employments; for it was a custom among the Greeks, when any man would excuse himself from a troublesome office by casting it upon another richer than himself, to challenge him to make an exchange of estates, and thereby compel him to fill the office he wished to avoid.

APOPHLEGMATICS, in medicine, *αποφλεγματισμος*; from *απο*, and *φλεγμα*, phlegm; medicines to promote the carrying off phlegmatic humors. They are of two kinds; one administered by the mouth, and intended to operate by spitting; the other by the nostrils, to operate by sneezing, &c.

APOPHORETA; from *αποφερω*, I carry away; in antiquity, presents made to the guests at a feast, or other entertainments, which they carried away with them. Martial gives a copious account of them in his fourteenth book of Epigrams, bearing this title. *Mart. in Apoph.*; *Suet. in Cal.* c. 55.

APOPHRADES; from *αποφρας*, unfortunate; in physic, or rather in superstition, unhappy days, wherein either no crisis, or an ill one is to be expected.

AP'OPHTHEGM, or AP'OTHEGM, APOTHEG'MATICAL, APOTHEG'MATIST. *Αποφθεγμα*; from *αποφθεγγομαι*, to speak out from, to sound apart. A detached sentence replete with meaning delivered as a moral rule, such as many of the Proverbs of Solomon; those of Plutarch; &c.

Julius Cæsar did write a collection of *apophthegms*, as appears in an epistle of Cicero; so did Macrobius, a consular man. I need say no more for the worth of a writing of that nature. Certainly they are of excellent use. Cicero prettily called them *salsas*

salt-pits, that you may extract salt of, and sprinkle it where you will. They serve to be interlaced in continued speech. They serve to be recited upon occasion by themselves. They serve, if you take out the kernel of them and make them your own.

Lord Bacon's Works, vol. i. p. 529.

We may magnify the *apophthegms*, or reputed replies of wisdom, whereof many are to be seen in Laertius and Lycosthenes. *Brown's Vulg. Errors.*

I had a mind to collect and digest such observations and *apophthegms*, as tend to the proof of that great assertion, 'All is vanity.' *Prior.*

In a numerous collection of our Saviour's *apophthegms*, many of them referring to sundry precepts of the Jewish law, there is not to be found one example of sophistry or of false subtilty, or of any thing approaching thereunto. *Paley's Evidences.*

APOPHYGE; *αποφυγη*, flight, or escape; in architecture, that part of a column where it begins to spring out of its base; and was originally no more than the ring or ferrel, which anciently bound the extremities of wooden pillars, to keep them from splitting, and were afterwards imitated in stone work. We sometimes call it the spring of the column.

APOPHYLLITE. Ichthyophthalmite, or fish-eyestone. It is found both massive and crystallised in square prisms, whose solid angles are sometimes replaced by triangular planes, or the prisms are terminated by pyramids consisting of four rhomboidal planes. Structure lamellar and uneven. Semitransparent. Moderately hard and easily broken. Specific gravity, 2·49. It consists of 51 silica, 28 lime, 4 potash, and 17 water. It is found in the iron-mine of Utoe, in Sweden; at the copper-mine at Fahlun, at Arendahl, Faroe, the Tyrol, and Isle of Sky.

APOPHYSIS, *αποφυσις*; in anatomy, the prominent parts of some bones; the same as process. It differs from an epiphysis, as it is a continuance of the bone itself; whereas the latter is something adhering to a bone, and of which it is not properly a part.

APOPHYSIS, in botany, an excrescence from the receptacle of the musci.

APOPLANESIS; from *αποπλαναω*, I deceive; in oratory, a kind of fallacious defence, or darkening, and concealing things, in order to blind the judge or the audience. It also implies that species of evasion, wherein the speaker promises to answer what the adversary objects in another place, &c.

APOPLECTIC VEINS, a name given to the jugulars; sometimes also denominated among ancient writers, soporales.

APOPLECTICA, apoplectical medicines, a name used by some for what are more properly called Antapoplectics.

APOPLECTICAL BALSAMS, a sort of sweet-scented balms, prepared of distilled oils and used by way of perfume.

APOPLEXY, in medicine, *αποπληξια*; from *απο*, and *πλησσω*, to strike; that disorder which suddenly surprises the brain, and takes away all sense and motion. The cause is generally a retention, and indicates evacuation, joined with stimuli. Cullen ranks it in the class neuroses, and order comata. When it takes place from a congestion of blood, it is termed apoplexia sanguinea: and when there is an abundance of serum, as in persons of a cold temperament, apoplexia serosa; if it arise from water in the ventricles of the brain, it is called apoplexia hydrocephalica; if from a wound, apoplexia traumatica; if from poisons, apoplexia venenata; if from the action of suffocating exhalations, apoplexia suffocata; if from passions of the mind, apoplexia mentalis; and when joined with catalepsy, apoplexia cataleptica. See MEDICINE.

APOPOMPÆ, in antiquity, certain days in which sacrifices were offered to the gods called Pompæi. Who these deities were is doubtful.

APOPSYCHIA; from *αποψυχω*, I expire in astrology, is understood of effluvia emitted from the sun, moon, and other heavenly bodies; to which their influence on sublunary things was ascribed.

APORIA; *αποριa*; in rhetoric, a figure by which the speaker shows that he doubts where to begin for the multitude of matter, or what to say in some strange or ambiguous thing; and does, as it were, argue the case with himself. Thus Cicero: 'Whether he took them from his fellows more impudently, gave them to a harlot more lasciviously, removed them from the Roman people more wickedly, or altered them more presumptously, I cannot well declare.' *Smith's Rhetoric.*

APORIME, APORON; from *απορος*, difficult, impracticable; in mathematics and philosophy, a problem difficult to resolve, and which has never been resolved, though it be not in itself impossible; such as the quadrature of the circle, the duplicature of the cube, the trisection of an angle, &c. When a question was proposed to any of the Greek philosophers, especially of the sect of Academists; if he could not give a solution, his answer was, *Απορεω*, 'I cannot see through it.' This word is also used by some law writers for an inexplicable speech or discourse.

APORRHŒA, in astrology, is when the moon separates from one planet and applies to another.

APORRHŒA, in physic, is used for morbid or contagious miasmata, or effluvia from unwholesome bodies. The word is also used to denote a shedding or falling off of the hair. See ALOPECIA. Also, in philosophy, sulphureous effluvia, or exhalations, emitted from the earth and subterraneous bodies.

APOS, in ornithology, the sea-swallow.

APOSCEPARNISMUS; from *απο*, and *σκεπαρνον*, a hatchet; in surgery, a species of fracture of the skull or other bone, wherein a piece is taken clearly off, as if cut out with a hatchet.

APOSIOPÉSIS; from *απο*, from, and *σιωπαω*, to be silent; in rhetoric, a form of speech, by which the speaker through some affection, as sorrow, fear, anger, or vehemency, breaks off his speech before it is all ended. A figure, when speaking of a thing, we yet seem to conceal it, though indeed we aggravate it; or when the course of the sentence begun is so stayed, as thereby some part of the sentence not being uttered, may be understood. It is commonly used to denote the same with ellipsis, but Jul. Scaliger distinguishes them.

APOSITION; from *απο*, and *σιτος*, food; in medicine, an aversion to food. It amounts to much the same with anorexia; though some

make a difference; alleging that the latter imports an inappetency, or want of desire to eat; the former an aversion or loathing of it.

APOSPASMA; from *αποσπαω*, I tear off; in medicine, denotes a solution of continuity in some organical part, as a membrane, ligament, or the like.

APOSPHACELIS, or APOSPHACELISIS; from *αποσφακελος*, mortification; in the ancient physic, denotes a mortification of a fleshy part, happening in cases of wounds and fractures from too light a ligature.

APOSPHARAGISMA; from *απο*, and *σφραγιζω*, to seal; in antiquity, the figure or impression of a seal. It was forbidden among the ancients to have the figure or image of God on their rings and seals. To this purpose the precept of Pythagoras, *Εν δακτυλιω εικονα Θεϐ μη περιφερειν*. But in process of time, this was little regarded; it was usual to have the figures of Egyptian and other deities, as well as of heroes, monsters, friends, ancestors, and even brutes, on their dactyli, or ring seals. Thus Cæsar had the image of Venus, Pollio of Alexander, Augustus of the sphinx, Pompey of a frog, Lentulus of his grandfather, &c.

APOSPONGISMUS, among ancient physicians, the application of a sponge, whether dry or soaked with water, either to cleanse a part, or to ease pains, allay itchings, or refresh the spirits.

APOSTACY, *v.* & *n.* } *Αφιστημι*, to stand
APOS'TATE, *v. n.* & *adj.* } away from. To re-
APOS'TATIZE, } nounce sentiments,
APOSTAT'ICAL. } to desert former opinions or practices. Usually applied to one who has forsaken his religion. See APOSTATE.

> But Lucifer he put aweie,
> With al the route *apostasied*,
> Of hem that ben to him allied,
> Whiche out of heauen into helle,
> From angels into fendes felle.
> *Gower. Con. A.* book viii.
>
> The affable archangel had forewarn'd
> Adam, by due example, to beware
> *Apostasy*; by what befel in heav'n
> To those *apostates*. *Milton.*

Vice in us were not only wickedness, but *apostasy*, degenerate wickedness. *Sprat.*

The canon law defines *apostasy* to be a wilful departure from that state of faith which any person has professed himself to hold in the Christian church. *Ayliffe's Parergon.*

Apostates in point of faith are, according to the civil law, subject unto all punishments ordained against heretics. *Id.*

Whoever do give different worships, must bring in more gods; which is an *apostasy* from one God. *Stillingfleet.*

The angels, for disobedience, thou hast reserved to a miserable immortality; but, unto man, equally rebellious, equally *apostate* from thee and goodness, thou hast given a Saviour. *Rogers's Sermons.*

APOSTAGMA; from *αποσταζω*, I distil; in natural history, the juice which runs from the grapes before they are trodden or pressed. It is also called apostalagma.

APOSTASIS; from *αφιστημι*, I depart, &c.; in physic, the same with abscess. The word also denotes a removal of the morbid matter, in the crisis of a disease It is likewise used by Hippocrates for a fracture of a bone, wherein some part is entirely broken off.

APOSTATA CAPIENDO, in the English law, a writ that formerly lay against a person, who, having entered into some order of religion, broke out again, and wandered up and down the country.

APOSTATE. There is this difference between an apostate and a heretic; that the latter only abandons a part of the faith, whereas the former renounces the whole.

Among the Romanists, apostasy signifies the forsaking of a religious order, whereof a man had made profession, without a lawful dispensation.

The ancients distinguished three kinds of apostasy: the first, à supererogatione, is committed by a priest, or religious, who abandons his profession, and returns to his lay state; the second, à mandatis Dei, by a person of any condition who abandons ,the commands of God, though he retains his faith; the third, à fide, by him who abandons not only his works but also the faith.

The primitive Christians distinguish several kinds of apostasy. The first was that of those who relapsed from Christianity into Judaism; the second, that of those who blended Judaism and Christianity together; the third, that of those who so far complied with the Jews as to communicate with them in many of their unlawful practices, without making a formal profession of their religion; and the fourth, was that of those who after having been Christians voluntarily relapsed into Paganism. The perversion of a Christian to Judaism, Paganism, or other false religion, was punished by the emperors Constantius and Julian with confiscation of goods; to which the emperors Theodosius and Valentinian added capital punishment in case of the apostate's perverting others to the same iniquity; a punishment, says Blackstone, too severe for any temporal laws to inflict upon any spiritual offence, and yet the zeal of our ancestors imported it into this country; for we find by Bracton, that in his time apostates were burnt to death. It is also said to have been anciently punishable in England by burning, and tearing to pieces by horses. Thus Fleta, 'lib. i. c. 37, sect. 2., 'apostati et sacrilegi, et hujusmodi, detractari debent et comburi;' and, sect. 4. 'Si inde convincantur, detractentur, et suspendantur.' Where Du Cange interprets, detractari, by tirer à quatre chevaux.

This punishment has long ago become obsolete, and the offence of apostasy was for a long time the object only of the ecclesiastical courts, which corrected the offender pro salute animæ. Nevertheless, it was enacted by statute 9 and 10 Will. III. c. 32. that if any person educated in, or having made profession of, the Christian religion, shall, by writing, printing, teaching, or advised speaking, deny the Christian religion to be true, or the Holy Scriptures to be of divine authority, he shall, upon the first offence, be rendered incapable to hold any office or place of trust; and, for the second, be rendered incapable of bringing any action, being guardian, executor, legatee, or purchaser of lands, and shall suffer three years' imprisonment without bail. To give

room, however, for repentance, if within four months after the first conviction, the delinquent will, in open court, publicly renounce his error he is discharged for that once from all disabilities. Such, however, is the spirit of toleration which has prevailed in this country, that penal statutes in the province of religion, have generally *lain dormant*, and find few advocates in modern times.

APOSTEME, APOSTUME; *αποστημα*; a hollow swelling, filled with purulent matter; an abscess.

APOSTERIGMA; from *απο*, and *στηριζω*, I support; in the ancient physic, denotes a support for a diseased part, without binding.

A POSTERIORI, or demonstration à posteriori. See DEMONSTRATION.

APOSTIL, APOSTILLA, in literary matters, a marginal note to a book.

APOSTLE, APOS'TLESHIP, APOSTOL'ICAL, APOSTOL'ICALLY, APOSTOL'ICALNESS, APOSTOL'ICK. APOS'TOLATE. } *Αποστολος*; from *αποστελλω*, to send a messenger. Particularly applied to the disciples of Christ invested with his special authority to preach the gospel.

And whanne the day was come, he clepide hise disciplis and chees twelve of hem, whiche he clepide also *apostlis*. *Wiclif. Luk.* ch. vi.

But all his mind is bent to holiness;
His champions are the prophets and *apostles*.
Shakspeare.

Their oppositions, in maintenance of public superstition against *apostolick* endeavours, were vain and frivolous. *Hooker.*

Or where did I at sure tradition strike,
Provided still it were *apostolick?* *Dryden.*

I am far from pretending infallibility; that would be, to erect myself into an *apostle*; a presumption in any one that cannot confirm what he says by miracles. *Locke.*

We know but a small part of the notion of an *apostle*, by knowing barely that he is sent forth.
Watts's Logic.

Last in the papal standard they display
The triple crown, and *apostolic* key;
Ev'n thousand valiant Romans marched behind,
And great Cammillo had the charge assign'd.
Brooke's Jerusalem Delivered, bk. i.

From such *apostles*, O ye mitred heads,
Preserve the church, and lay not careless hands
On skulls that cannot teach, and will not learn.
Cowper.

APOSTLE, *αποστολος*; from *αποστελλω*; signifies a person delegated or sent, in which sense it occurs in Herodotus, and other profane authors. It is applied in a way of eminence to those commissioned and sent forth by Jesus Christ personally to preach the gospel. These, who were twelve in number, were selected from the aggregate of the disciples by our Saviour, that they might be with him more particularly than the rest of the disciples, for the purpose of learning his doctrine, and seeing his miracles; that they might thereby be prepared to propagate his religion. Their names were, Simon Peter, and Andrew his brother; James the greater, and John his brother, who were sons of Zebedee; Philip of Bethsaida, Bartholomew, Thomas, Matthew, James the son of Alpheus, commonly called James the less; Lebbeus his brother, who was surnamed Thaddeus, and was called Judas, or Jude; Simon the Canaanite, and Judas Iscariot. Of this number, Simon Peter, John, James the greater, and Andrew, were fishermen, and Matthew a publican or tax-gatherer. This choice was designed to glorify the cause; for, had men of eloquence, birth, or fortune, been employed, the world might have attributed the success of the gospel to natural causes. There are various conjectures as to the reason of his choosing exactly twelve. The most probable is, that it might be in allusion to the twelve patriarchs, as the founders of their several tribes; or to the twelve chief rulers of those tribes, of which the body of the Jewish nation consisted. This opinion seems to be countenanced by what our Saviour tells his apostles, that 'when the Son of man shall sit upon the throne of his glory, they also shall sit upon twelve thrones, judging the twelve tribes of Israel.' Our Lord's first commission to his apostles was in the third year of his public ministry, about eight months after their election; at which time he sent them out by two and two. They were to make no provision of money for their subsistence; to declare that the kingdom of heaven, or the Messiah, was at hand; to confirm their doctrine by miracles; to confine their preaching to the people of Israel, and to avoid going either to the Gentiles or the Samaritans. In obedience to their master they went into all parts of Palestine, and then returned to Christ. Their second commission was of a more extensive nature, viz. to 'go and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost.' Accordingly they began publicly, after our Lord's ascension, to exercise their ministry, working miracles in proof of their mission, and converting great numbers to the christian faith. They were apprehended by the Sanhedrin, and, being examined before the high priest and elders, were commanded not to preach any more in the name of Christ. But they continued daily in the temple, and private houses, teaching and preaching as before.

After the death of Judas another was added in his room; and, after the rejection of the gospel by the Jews, Paul and Barnabas were selected without any regard to the number—twelve, and set apart as apostles of the Gentiles. To constitute an apostle it was necessary that he should have seen our Lord alive after his crucifixion, because they were to testify of his resurrection. When Paul saw him is uncertain. Some imagine it was at the time of his conversion at Damascus; others think it was when he returned to Jerusalem the second time after his conversion, Acts xxii. 17. where he was called to the ministry, and directed to the Gentiles, Acts xxvi. 16—20.

After the apostles had preached twelve years in Judea, tradition says they dispersed themselves into different parts of the world, for which they were supernaturally qualified by the power of speaking different languages and of working miracles. No authentic history affords any very distinct knowledge of the provinces assigned to each; nevertheless Eusebius, Hist. Ecc. lib. i. c. 1; and Socrates, Hist. Eccl. lib. i. c. 19. affirm,

that Thomas took Parthia; Matthew, according to the latter, took Ethiopia; Bartholomew, India. The former assigns Scythia to Andrew, and Asia Minor to John; James the less became bishop of Jerusalem, and the apostle Paul preached the gospel from the metropolis of Palestine to Illyricum. Other writers relate, that St. Peter went into Pontus, Galatia, and some places adjacent; St. Andrew into the vast northern countries of Scythia, and Sogdiana; St. John into the Lesser Asia; St. Philip into the Upper Asia, and some parts of Scythia and Colchis; St. Bartholomew into Arabia Felix; St. Matthew travelled into Chaldæa, Persia, and Parthia; St. Thomas into Hyrcania, Bactria, and India; St. Simon travelled into Egypt, Cyrene, Libya, and Mauritania; St. Jude, surnamed Thaddeus, or Lebbeus, into Syria and Mesopotamia; and St. Matthias into Cappadocia and Colchis. Many of the apostles suffered martyrdom—Peter was crucified with his head downwards; Paul was beheaded under Nero, at Rome. Heraclion, the Valentinian, reckons among the apostles who did not suffer martyrdom—Thomas, Philip, Matthew and Levi, probably meaning Lebbeus, surnamed Thaddeus.

The apostles are commonly represented with their several badges, or attributes: St. Paul with a sword; St. Jude with a club; St. Simon with a saw; St. Matthew with a hatchet; St. James the Greater with a pilgrim's staff and a gourd bottle; St. Thomas with a lance; St. Matthias with a battle-axe; St. Philip with a long staff, the upper end of which is formed into a cross; St. Bartholomew with a knife; St. James the Less with a fuller's pole; St. John with a cup and a winged serpent flying from it; St. Andrew with a cross or saltier; St. Peter with the keys. The testimony of men who were not apostles was admitted no farther than that of common historians.

Apostle is applied in an inferior sense to ordinary travelling ministers in the church. See Rom. xvi. 7. Tertullian, in this sense, calls all the seventy disciples, apostles. Clement, in this sense, applies the term to Barnabas, and is himself thus distinguished. Salvian calls Timothy an apostle. Those who planted the gospels in any particular place are likewise called apostles: thus Dionysius of Corinth is called the apostle of France; Xavier, the apostle of the Indies; Boniface, an Englishman, the apostle of Germany; and the Jesuit missionaries, the apostles of the East Indies. Formerly the pope was, in a way of eminence, called the apostle; and Sir Henry Spelman informs us that the same word was anciently used for admiral. Those who were sent by the churches to carry their alms to the poor of other churches were likewise called apostles, according to the usage of the Jewish synagogues. Thus Epaphroditus is called the apostle of the Philippians. Phil. ii. 25.

Apostle is thought by some authors to have been the original name for bishops. Theodoret says, the same persons were promiscuously called bishops and presbyters; and those now called bishops were called apostles.

Apostle, among the Jews, was the name of officers sent into the several provinces as commissaries to collect money for repairing the temple, to see that the laws were properly observed, and to gather the Roman tribute. They were a degree below patriarchs. Some authors affirm, that before his conversion, St. Paul filled this office, and that he alludes to this circumstance in the beginning of his epistle to the Galatians.

Apostle, in the Greek liturgy, is the name of a book containing the epistles of St. Paul arranged in the order in which they are appointed to be read in churches. A similar book containing the gospels is called *Ευαγγελιον*, Gospel; and another, containing the Acts of the Apostles and their epistles, is called *Πραξαποστολος*. Another, comprising lessons from the gospels and epistles, is called *Αποστολοευαγγελιον*. See *Du Cange, Gloss. Græc.* in voce. *Bishop Marsh's Michaelis*, vol. ii. pp. 111, 639.

The Apostles' Creed, though it has not the shadow of authenticity as a composition of the apostles, contains an early summary of doctrines. It is very similar to the creed of Jerusalem, the most ancient epitome of the Christian faith now extant. The whole form, as it stands in the English liturgy, is contained in the works of Ambrose and Ruffinus, who lived in the fourth century. In the early ages it made no part of the liturgy, although the catechumen subscribed to it before he was admitted to baptism. The repetition of it in public worship was first instituted in the Greek church at Antioch, and introduced in the Romish church in the eleventh century, whence it passed to the church of England at the reformation.

APOSTOLES Islands are situate in the straits of Magellan, at its entrance into the Pacific, near Cape Deseado. They are twelve in number; from which circumstance their name is derived. They are all small, barren, and desert; their shores, though they abound with good shell-fish, are very dangerous, from being rocky. Long. 75° 6′ W., lat. 52° 34′ S.

APOSTOLIC, Apostolical, something that relates to the apostles, or descends from them. Thus we say, the apostolic age, apostolical doctrine, &c. Apostolic, in the primitive church, was an appellation given to all such churches as were founded by the apostles; and even to the bishops of those churches, as being the reputed successors of the apostles. These were four, viz. Rome, Alexandria, Antioch, and Jerusalem. In after-times other churches assumed the same quality, and bishops held themselves successors of the apostles. In progress of time the bishop of Rome growing in power above the rest, and the three patriarchates of Alexandria, Antioch, and Jerusalem, falling into the hands of the Saracens, the title apostolical was restricted to the pope and his church alone. Though some of the popes and St. Gregory the Great, not contented to hold the title by this tenure, began, at length, to insist, that it belonged to them by another and peculiar right, as being the successors of St. Peter. The country of Rheims in 1049 declared that the pope was the sole apostolical primate of the universal church. And hence a great number of apostolicals: apostolical see, apostolical nuncio, apostolical notary, apostolical brief, apostolical chamber, apostolical vicar, &c.

APOSTOLICAL FATHERS, in ecclesiastical history, is an appellation usually given to the writers of the first century, who employed their pens in the cause of Christianity. Of these writers, Cotelerius, and after him Le Clerc, have published a collection in two volumes, accompanied both with their own annotations, and the remarks of other learned men.

APOSTOLICI, or APOSTOLICS, a name assumed by three different sects, on account of their pretending to imitate the practice of the apostles. 1. The first apostolici, called Apotactitæ and Apotactici, rose out of the Encratitæ and Cathari in the third century. They made profession of abstaining from marriage, the use of wine, flesh, money, &c. 2. Gerhard Sagarelli was the founder of the second sect. He obliged his followers to go from place to place, as the apostles did, to wander about, clothed in white, with long beards, dishevelled hair, and bare heads, accompanied with women, whom they called their spiritual sisters. They likewise renounced all kinds of property and possessions, inveighed against the growing corruption of the church of Rome, predicted its overthrow, and the establishment of a purer church on its ruins. Sagarelli was burnt alive at Parma in 1300, and was succeeded by Dulcinus, who added to the character of an apostle those of a prophet and general, and carried on a sanguinary war for more than two years against Raynerius, bishop of Vercelli. He was at length defeated, and put to death in a barbarous manner, A. D. 1307. This sect, however, subsisted in France, Germany, and in other countries, till the beginning of the fifteenth century, when it was totally extirpated under Boniface IX. 3. The last apostolici were of the twelfth century. These also condemned marriage, preferring celibacy, and calling themselves the chaste brethren and sisters; though each was allowed a spiritual sister, with whom he lived in a domestic relation; and on this account they have been charged with concubinage: they held it unlawful to take an oath; they set aside the use of baptism; and in many things imitated the Manichees. Bernard wrote against this sect.

APOSTOLICUM, a peculiar kind of song or hymn, anciently used in churches. It is mentioned by Greg. Thaumaturgus, as used in his time. Vossius understands it as spoken of the apostles' creed.

APOSTOLIUS (Michael), a learned Greek of the fifteenth century. He wrote a collection of apophthegms of wise men, and another of proverbs; but only abridgments of them have been published; of the former in 1619, and of the latter in 1538.

APOSTOLORUM UNGUENTUM, in pharmacy, the apostles' ointment, is a kind of detergent, or cleansing unguent, composed of twelve ingredients, whence its name. It was invented by Avicenna, and is also called unguentum veneris. The ingredients are turpentine, wax, gum ammoniac, birthwort roots, olibanum, bdellium, myrrh and galbanum, opoponax, verdigris, litharge, oil of olives, and vinegar.

APOSTOOL, a minister among the Mennonites at Amsterdam, who founded a new sect, which first sprung up in 1664. They concurred with the Mennonites in doctrine.

APOS'TROPHE, APOS'TROPHIZE, APOS'TROPHICK. Αποστροφη; from απο, and στρεφω, to turn. A turning away from the regular course of a speech, or discourse, to address some person or thing present or absent. In grammar, the contraction of a word by means of a comma at the beginning or ending of a word; as 'tis, for it is; tho', for though; David's for the ancient genitive Davides, &c.

Apostrophe is a sudden change in our discourse, when, without giving previous notice, we address ourselves to a person or thing different to that to which we were addressing ourselves before.

Beattie's Elements of Moral Science.

There is a peculiarity in Homer's manner of *apostrophizing* Eumæus, and speaking of him in the second person: it is generally applied only to men of account.

Pope.

APOSTROPHE, in rhetoric, is in boldness a degree lower than the address to personified objects (see PERSONIFICATION); since it requires a less effort of imagination to suppose persons present, who are dead or absent, than to animate insensible beings, and direct our discourse to them. The Poems of Ossian abound with beautiful instances of this figure. 'Weep on the rocks of roaring winds, O Maid of Inistore! Bend thy fair head over the waves, thou fairer than the ghost of the hills, when it moves in a sun-beam at noon over the silence of Morven! He is fallen! Thy youth is low; pale beneath the sword of Cuchullin!' Cicero, in his oration for Milo, addresses himself to the great patriots who had shed their blood for the public, and calls them to the defence of his client. The same orator, in his first Catilinarian, directs himself to Jupiter the protector of the city and empire, and beseeches him to repel the parricide, &c. His apostrophe to Tubero, in his oration for Ligarius, is judged one of the finest passages in his works. That apostrophe of Demosthenes, wherein he addresses himself to the Greeks slain at the battle of Marathon, is also famous: cardinal Perron says, it has procured the orator as much glory as if he had raised them from the dead. The apostrophe also frequently occurs in the sacred writings, 'Hear, O heavens,' says Isaiah, ch. i. 2, 'and give ear, O earth! for the Lord hath spoken.' 'Be astonished, O ye heavens! at this.' Jer. ii. 12.

APOSTROPHE, in medicine, a loathing of food.

APOSYRMA; from αποσυρω, I take off; in medicine, denotes a disquamation or scaling of the skin; in which sense the word amounts to much the same with abrasion.

APOTACTICI, or APOTACTITÆ; formed from αποτασσω, to renounce; an ancient sect, who, affecting to follow the evangelical counsels of poverty, and the examples of the primitive Christians, renounced all their effects and possessions. It does not appear that they fell into any errors during their first state: some ecclesiastical writers assure us, they had divers martyrs, under the persecution of Dioclesian, in the fourth century, but they afterwards fell into the opinion of the Encratitæ, and taught that the renouncing of all riches was not only a matter of advice, but

of precept and necessity. And therefore the sixth law in the Theodosian code joins the Apotactitæ with the Eunomians and Arians.

APOTEICHISMUS; from *αποτιχιζω*, to raise a wall; in the ancient military art, a line of circumvallation drawn round a place to besiege it. It was the first operation the ancients performed, and sometimes consisted of a double wall, or rampart, raised of earth; the innermost to prevent sudden sallies from the town, the outermost to keep off enemies from coming to the relief of the besieged. It answered to what we call lines of contravallation and circumvailation.

APOTELESMA; from *αποτελεω*, to perform; an effect of some cause; also a prognostic, or prediction of an event; in which sense Scaliger speaks of the apotelesmata of Hippocrates. The answers of astrologers deduced from the considerations of the stars are also called apotelesmata.

APOTELESMATICA, in philosophy, the art of foretelling future events from the aspects of the heavenly bodies; in which sense the word amounts to the same with judicial astrology.

APOTELESMATICI, astrologers.

APOTHECARIUS, in writers of the middle age, denotes a shop-keeper, or warehouse-keeper. Apothecarius is also used to denote a store-keeper, or officer appointed to have the direction of a magazine, granary, &c. In which sense apothecarii is sometimes rendered by horearii and rationarii.

APOTHECARY. *Αποθηκη*; a repository; from *απο*, and *τιθημι*, to put. A person who sells drugs and administers them according to his own knowledge of medicine, or under the direction of a physician.

Give me an ounce of civet, good *apothecary*, to sweeten my imagination. *Shakspeare's King Lear.*

They have no other doctor, but the sun and the fresh air; and that, such an one, as never sends them to the *apothecary*. *South.*

Wand'ring in the dark,
Physicians, for the tree, have found the bark;
They, lab'ring for relief of human kind,
With sharpen'd sight some remedies may find;
Th' *apothecary*-train is wholly blind. *Dryden.*

APOTHECARY, in modern times, is particularly one who practises the art of pharmacy. In London the apothecaries are one of the city companies. They were incorporated by a charter from James I. procured at the solicitation of Dr. Mayerne and Dr. Atkins: till that time they only made a part of the grocers' company; plums, sugar, spice, Venice treacle, mithridate, &c. were sold in the same shop, and by the same person. The reason of separating them was, that medicines might be better prepared, and in opposition to divers persons who imposed unwholesome remedies upon the people. By an act which was made perpetual in the 9th Geo. I. they are exempted from serving upon juries, or in ward and parish offices. Their arms are argent, Apollo, armed with a bow and arrow, bestriding a python; their supporters two unicorns, and the crest a rhinoceros surmounting a torce and helmet. The motto 'Opifer per Orbem dicor.'—They are obliged to make up their medicines according to the formulas prescribed in the college dispensatory; and are liable to have their shops visited by the censors of the college, who are empowered to destroy such medicines as they think not good. They have a hall in Blackfriars, where there are two fine laboratories, out of which all the surgeons' chests are supplied with medicines for the British royal navy. His Majesty has two apothecaries; and two belong to the royal household.

The benevolent dispensation of medicines by the Chinese is well deserving attention. In the public squares of their cities they have set up a stone ten cubits in height, on which they have engraved the names of all sorts of medicine, with the price affixed to each; and when the poor stand in need of any relief from physic they go to the treasury, where they receive the price of the medicine they want.

APOTHEOSIS. *Αποθεωσις*; from *απο*, and, *θεος*, a God; a placing among the gods. The ceremony observed among the ancients at a deification, or adding any hero or great man to the number of the gods.

As if it could be graved and painted omnipotent, or the nails and the hammer could give it an *apotheosis*. *South.*

Allots the prince of his celestial line,
An *apotheosis*, and rites divine. *Garth.*

Among the Romans, the ceremony of deifying their emperors was, according to Herodian, as follows: After the body of the deceased had been burnt with the usual solemnities, an image of wax, exactly resembling him, was placed on an ivory couch, where it lay for seven days, attended by the senate and ladies of the highest quality; then the young senators and knights bore the bed of state through the via sacra to the old forum, and thence to the campus martius, where it was deposited upon the edifice built in form of a pyramid. The bed being thus placed amidst a quantity of spices and other combustibles, and the knights having made a solemn procession round the pile, the new emperor, with a torch in his hand, set fire to it, whilst an eagle, let fly from the top of the building, and mounting in the air with a firebrand, was supposed to convey the soul of the deceased to heaven; and thenceforward he was ranked among the gods! We often meet with the consecration or apotheosis of emperors represented on medals, where we see the pyramids of several stories, each growing less and less; the eagles flying away with the souls of the deceased emperors! A gem in the museum of Brandenburg represents the apotheosis of Julius Cæsar, mounted upon the celestial globe, and holding a helm in his hand, as if he were now the governor of heaven, as before of the earth. See DEIFICATION. After the apotheosis, temples, altars, and images, were erected to the new deity; sacrifices, &c. were offered, colleges of priests instituted, and the devotees swore by his name! It was one of the doctrines of Pythagoras, which he had borrowed from the Chaldees, that virtuous persons after their death were raised to the order of the gods. And hence the ancients deified all the inventors of things useful to mankind, and those who had done any important service to the commonwealth. This

rius proposed to the Roman senate the apotheosis of Jesus Christ, as is related by Eusebius, Tertullian, and Chrysostom; but the senate, though generally very obsequious to the emperor, and extremely ready to adopt the gods of even conquered nations, did not agree to this proposal. Juvenal rallying the frequent apotheoses, introduces poor Atlas, complaining that he was ready to sink under the burden of so many new gods as were every day added to the heavens. Seneca ridicules the apotheosis of Claudius with admirable humor.

APOTHERAPIA; from *αποθεραπευω*, to cure; in physic, properly denotes a complete or finished cure.

APOTHERAPIA, in the gymnastic art, the last part of all regular exercises, viz. friction or unction with oil, before and after bathing; partly to cleanse the skin from any filth or dust it might have contracted during the exercise, and partly to remove weariness.

APOTHERMUM; from *απο*, and *θερμος*, hot; in ancient writers, a sharp kind of sauce, prepared of mustard, oil, and vinegar, or of vinegar alone.

APOTHRAUSIS, in surgery, the removal of a fragment of fractured bone. *Gorr. Defin. Med.*

APOTOME, in music, a small interval remaining after a limma is taken from a major tone, expressed by $\frac{2187}{2048}$. The ancients thought that the greater tone could not be divided into two equal parts, for which reason they called the first apotome, and the second limma (*λειμμα*), the remainder.

APOTOME, in mathematics; from *αποτεμνω*, I cut off; the remainder or difference between two lines or quantities which are only commensurable in power. Such is the difference between 1 and $\sqrt{2}$, or the difference between the side of the square and its diagonal. It is used by Euclid, and a pretty full explanation of such quantities is given in the 10th book of his Elements, where he distinguishes six kinds of apotomes, and shows how to find them all geometrically. The first apotome is, when the greater is rational, and the difference between their squares is a square number, as in the numbers $6 + \sqrt{20}$, $6 - \sqrt{20}$ is the apotome. The second apotome is when the less number is irrational, as $\sqrt{18} - 4$, the difference between the squares 18 and 16, is 2 and the $\sqrt{2}$ is as 1 to 3.—The third apotome is when both the numbers are irrational, as $\sqrt{24} - \sqrt{18}$, for the difference of their squares 24 and 8 is 6, and $\sqrt{6}$ is to $\sqrt{24}$ as 1 to 2.—The fourth apotome is when the greatest number is rational, and the square root of the difference of the squares has no ratio to it, such is $4 - \sqrt{3}$, where the difference of the squares 16 and 3 is 13, and $\sqrt{13}$ has no ratio in numbers to 4.—The fifth apotome is when the least number is rational, and the square root of the difference of the squares of the two numbers has not a ratio in numbers to the greatest, as $\sqrt{6} - 2$, where the difference of the squares 6 and 4 is 2, and $\sqrt{2}$ to $\sqrt{6}$ has not a ratio in numbers.—The sixth apotome is when both the numbers are irrationals, and the square root of the difference of their squares has not a ratio in numbers to the greatest, as $\sqrt{6} - \sqrt{2}$, where the difference of the squares 6 and 2 is 4, and $\sqrt{4}$ to $\sqrt{6}$ is not a rational ratio. *Euclid. Elem.* b. 10, prop. 80, et seq.; *Papp. Math. Coll.* Introd. l. 7.

APOTREPÆA; from *αποτρεπω*, to avert; in the ancient poetry, verses composed for averting the wrath of incensed deities.

APOTREPÆAN Gods, Deities invoked to avert any threatened misfortune; called also Alexiaci and Averrunci.

APOZEM; *απο*, from, and *ζεω*, to boil; in medicine, a decoction; an infusion made by boiling ingredients.

AP'PAIR. Sax. apæþan; to overthrow, to spoil. The word now in use is IMPAIR, which see.

He had a sonne Harald, heyre of his tenement,
Engle his wife he drofe away, and held in *peyrment*.
Robert Brunne. p. 58.

For what profitith it to a man, if he wynne al the world, and do *peyrynge* to his soule?
Wiclif. Mark. ch. viii.

Sith that, their hope gan fail, their hope to fall,
Their power *appeir*, their goddesse grace withdraw.
Surrey. Aenæis. bk. ii.

APPAL', APPAL'MENT. Compounded of *ad*, and *palleo*, to make pale. To dismay, to decay, to droop, to wither.

And amonge other of his famous dedis he (Ereõbertus) reuyued and quickened agayn the fayth of Crist, yt in some placis of his kyngedome was sore *appallyd*. *Fabian.*

It was rather an execution then a fight upon them, insomuch as the furious slaughter of them was a great discouragement and *appalement* to the rest.
Bacon's King Henry VII

Whilst she spake, her great words did *appal*
My feeble courage, and my heart oppress,
That yet I quake and tremble over all. *Faerie Queene.*

Give with thy trumpet a loud note to Troy,
Thou dreadful Ajax; that th' *appalled* air
May pierce the head of thy great combatant.
Shakspeare.

The House of Peers was somewhat *appalled* at this alarum; but took time to consider of it, till next day.
Clarendon.

Does neither rage inflame, nor fear *appal*,
Nor the black fear of death, that saddens all? *Pope.*

The storms of sad confusion that may grow
Up in the present for the coming times,
Appal not him, that hath no side at all,
But of himself, and knows the worst can fall.
Daniel's Poems.

The monster curls
His flaming crest, all other thirst *appall'd*;
Or shiv'ring flies, or chok'd at distance stands.
Thomson.

Guilt hears *appall'd*, with deeply troubled thought;
And yet not always on the guilty head
Descends the fated flash. *Id.*

If wearied nature sinks,
His sleep is troubled; visions of the night
Appal his spirit; starting, he forsakes
A thorny pillow; rushes on the deck
With lamentations to the midnight moon.
Glover's Athenaid, bk. i.

Him who ne'er listen'd to the voice of praise,
The silence of neglect can ne'er *appal*.
Beattie's Minstrel.

No kind star
To-night will guide thee, traveller! and the roar
Of winds and elements on thy head will break,
And, in thy agonizing ear the shriek
Of spirits, howling on their stormy car,
Will often ring *appalling*. *Kirke White's Poems.*

APPALACHICOLA, a river of North America, rising in the north point of Georgia, in the Apalachian mountains, about ten miles from Tungaloo, the upper branch of Savannah river. From its source to latitude thirty-one north, where it is joined by Flint river, a distance of 300 miles, it is called Chata-Uche, or Chatahooche river, and forms the boundary line between Georgia and West Florida. Thence it runs south near 80 miles, and falls into the bay of Appalachicola, in the gulf of Mexico, at Cape Blaize, and forms the boundary between East and West Florida. Long. 84° 50′ W., lat. 29° 52′ N.

APPAMATOX, or APPOMATOX, the southern branch of James river in Virginia, which is navigable to Petersburgh, about twenty miles above its junction with James river, below Richmond.

APPARATUS. Lat. *apparatus*; from *apparo*, I make preparation. Now applied to the component parts of machinery, or the utensils employed for effecting any purpose.

APPARATUS, in literary matters, is a title of books in the form of catalogues, bibliothecas, dictionaries, &c. for the ease and conveniency of study. The apparatus to Cicero is a kind of concordance, or collection of Ciceronian phrases, &c. The apparatus sacer of Possevin is a collection of all kinds of ecclesiastical authors, printed in 1611, in three volumes. Glossaries, comments, &c. are also frequently called apparatuses.

APPARATUS, in surgery, the bandages, medicaments, and dressings of a part; or the several matters applied for the cure of a wound, ulcer, or the like. The word is also used for the operation of cutting for the stone. For this there are three sorts of apparatus, viz. the small, great, and high apparatus. See SURGERY.

APPAR'EL, *v.* & *n.* } Fr. *appareiller*, from
APPARAYLMENT. } the Lat. *apparare*, to prepare. To prepare, to provide with what is requisite or suitable, to dress, to array.

Thou that art prowde of honour, shape, or kynne,
That hepest vp this wretched worldes treasure.
Thy fingers shryned with gold, thy tawny skynne
With fresh *apparyle* garnished out of measure,
And wenest to haue fortune at thy pleasure,
Cast vp thyne eye, and loke how slipper chaunce
Illudeth her men with chaunge and varyaunce.
Sir Thos. Moore.

And whanne sum men seiden of the temple that it was *apearelid* with goode stoones, and giftis, he seide, &c. *Wiclif. Luke* ch. xxi. p. 52.

The maiden is ready for to ride
In a full riche *aparylement*
Of samte green, with mickle pride,
That wrought was in the orient.
Morte Arthur. Ellis' Romances, vol. i.

It is much that this depraved custom of painting the face should so long escape the penal laws, both of the church and state, which have been very severe against luxury in *apparel*. *Bacon.*

You may have trees *apparelled* with flowers, by boring holes in them, and putting into them earth, and setting seeds of violets. *Id.*

KING RICH. I'll give my jewels for a set of beads,
My gorgeous palaces for a hermitage,
My gay *apparel* for an almsman's gown,
My figured goblets for a dish of wood;
My sceptre for a palmer's walking-staff,
My subjects for a pair of carved saints,
And my large kingdom for a little grave.
Shakspeare. King Richard II.

With such robes were the king's daughters, that were virgins, *apparelled*. 2 *Sam.* xiii. 18

Both combatants were *apparelled* only in their doublets and hose. *Hayward.*

Our late burnt London, in *apparel* new,
Shook off her ashes, to have treated you. *Waller.*

At public devotion, his resigned carriage made religion appear in the natural *apparel* of simplicity. *Tatler.*

APPA'RENCE, } Fr. *apparence*; Lat. *appa-*
APPA'RENCY, } *reo, appareas*, from *ad* and
APPA'RENT, } *pareo*, from the Greek παρεω, to be present. To come
APPA'RENTLY, } into sight or view, to seem,
APPARI'TION. } to look, to be likely. Apparition, an ideal existence perceived by the imagination, a seeming being. Apparent, connected with the word heir, means the next in succession to an estate or property, whose right, in point of heirship, cannot be defeated—as the eldest son. Apparent, in astronomy, is opposed to real; as apparent conjunction, &c.

He made Edwyn his leutenant,
Whiche heire was *apparant*,
That he the londe in his absence
Shall rewle. *Gower. Con. A.* bk. i.

Another rowned to his felaw low,
And sayd, he lieth, for it is rather like
An *apparence* ymade by som magike,
As jogelours plaien at thise festes grete.
Chaucer. The Squire's Tale. vol. i. p. 427.

But we preache of a heauenly wisedom which hath an outeward *apparance* of that which is not within it; but is inwardelye mighte and effectuall.
Udall. 1 *Corin.* ch. ii.

Draw thy sword in right.——
——I'll draw it, as *apparent* to the crown;
And in that quarrel use it.
Shakspeare's Henry VI.

Horatio says, 'tis but our phantasy,
Touching this dreaded sight, twice seen of us:
Therefore I have intreated him,
That, if again this *apparition* come,
He may approve our eyes, and speak to it.
Id. Hamlet.

I have mark'd
A thousand blushing *apparitions*
To start into her face; a thousand innocent shames
In angel whiteness bear away those blushes.
Shakspeare.

He is the next of blood,
And heir *apparent* to the English crown.
Id. Henry VI.

As well the fear of harm, as harm *apparent*,
In my opinion ought to be prevented.
Id. Richard III.

Arrest him, officer;
I would not spare my brother in this case,
If he should scorn me so *apparently*.
Id. Comedy of Errors.

When suddenly stood at my head a dream,
Whose inward *apparition* gently moved
My fancy. *Milton.*

The heavenly bands
Down from a sky of jasper lighted now
In Paradise, and on a hill made halt;
A glorious *apparition*, had not doubt
And carnal fear that day dimm'd Adam's eye.
Milton.

My retirement tempted me to divert those melancholy thoughts, which the new *apparitions* of foreign invasion and domestic discontent gave us. *Denham.*

Vices *apparently* tend to the impairing of men's health. *Tillotson.*

What secret imaginations we entertained, is known to God: this is *apparent*, that we have not behaved ourselves as if we preserved a grateful remembrance of his mercies. *Atterbury.*

The outward and *apparent* sanctity of actions should flow from purity of heart. *Rogers.*

The perception intellective often corrects the report of phantasy; as in the *apparent* bigness of the sun, in the *apparent* crookedness of the staff in air and water. *Hale's Origin of Mankind.*

This is creation's melancholy vault,
The vale funereal, the sad cypress gloom,
The land of *apparitions*, empty shades;
All, all on earth is shadow; all beyond is substance!
Young.

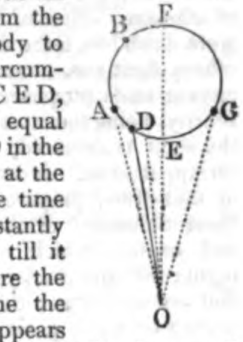
There is something captivating in spirit and intrepidity, to which we often yield, as to a resistless power; nor can he reasonably expect the confidence of others who too *apparently* distrusts himself. *Rambler.*

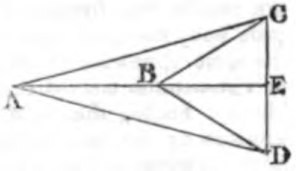
In futurity, events and chances are yet floating at large, without *apparent* connexion with their causes; and we therefore easily indulge the liberty of gratifying ourselves with a pleasing choice. *Id.*

Oft from *apparent* ill our blessings rise.
Beattie's Minstrel.

Apparent, in astronomy, is an epithet extensively applied to things as they appear to the eye, in distinction from what they really are, as in regard to the conjunction, diameter, distance &c., of the heavenly bodies. The apparent conjunction of the planets is when they appear to be placed in the same right line with the eye of the spectator. The apparent diameter is the angle under which we see the sun, moon, and stars, as when we see the sun, S, under the angle D O E. This angle is the sun's apparent diameter, which is the least when he is in ♋, and the greatest when in ♑. The apparent place of a planet is that point in the sphere of the world at which you see the centre of the sun, moon, or stars, from the surface of the earth. The apparent station is the position or appearance of a planet or comet in the same point of the zodiac for several days successively.

Apparent Distance, in optics, is that distance which we judge an object to be from us when seen from afar off, which may be very different from the real distance; thus the heavenly bodies appear to be at the same distance, although there is the difference of many thousand miles between their distances. Apparent motion, that motion which we perceive in a distant body that is moving whilst the eye is either at rest or in motion; or that motion which an object at rest seems to have whilst the eye itself really is in motion; thus very swift motions, as those of the luminaries, may not appear to be any motions; and on the other hand, supposing the eye to move forwards in one direction, any remote object at rest will appear to move in a parallel line the contrary way. The more oblique the eye is to the line or plane which a distant body moves in, the more will the apparent motion differ from the true one. Suppose a body to revolve equably in the circumference of a circle, A B F C E D, describing equal arcs in equal times, and the eye be at O in the plane of that circle, when at the point A it seems for some time to stand still, and constantly afterwards to move faster till it gets to the point F, where the motion appears to become the greatest; after which it appears to decrease till the body comes to C, when it will again seem to stand still; and then its apparent motion will increase backwards till the body arrives at E, where it will seem again to move fastest. The apparent magnitude of an object, the magnitude as it appears to the eye, the measure of which is the quantity of the optic angle; as suppose D to be an object viewed by the eye at A B, then C A D is the apparent magnitude of the object when viewed at A, and C B D the apparent magnitude of that object viewed at B. The apparent place of the image of an object, that in which the image of an object appears to be which is made by the reflection of a speculum. This, according to Euclid and others, is when the reflected rays meet the perpendicular drawn from the object to the speculum.





Apparent Heirs, in law, are such, whose right of inheritance is indefeasible, provided they outlive the ancestors; as the eldest son or his issue, who must by the course of the common law be heirs to the father whenever he happens to die. Heirs presumptive are such, who, if the ancestor should die immediately, would in the present circumstances of things be his heirs: but whose right of inheritance may be defeated by the contingency of some nearer heir being born; as a brother or nephew, whose presumptive succession may be destroyed by the birth of a child; or daughter, whose present hopes may be hereafter cut off by the birth of a son. Nay, even if the estate hath descended, by the death of the owner, to such brother, or nephew, or daughter; in the former cases, the estate shall be divested and taken away by the birth of a posthumous child; and, in the latter, it shall also be totally divested by the birth of a posthumous son.

Apparition, in astronomy, denotes a star or other luminary becoming visible, which before was hid. The heliacal rising is rather an apparition than a proper rising.

Apparitions. Several instances of apparitions occur in the Bible; that of Samuel raised by the witch of Endor, has occasioned great dis-

putes, and great controversies have existed in relation to the reality, the existence or non-existence of apparitions generally. The Chaldeans, Jews, and other nations, have been steady believers in apparitions; the denial of which is by some made one of the marks of infidelity, if not of atheism. Most of the apparitions on record were doubtless mere delusions of the sense, and others fictitious, contrived merely to amuse, or answer some purpose. Partial darkness, or obscurity, being the most powerful means by which the sight is deceived, night is the proper season for apparitions. Indeed the state of the mind, at that time, prepares it for the admission of these delusions of the imagination. The fear and caution which must be observed in the night; the opportunity it affords for ambuscades and assassinations; depriving us of society, and cutting off many pleasing trains of ideas, which objects in the light never fail to introduce, are all circumstances of terror; and perhaps, on the whole, so much of our happiness depends upon our senses, that the deprivation of any one may be attended with proportionable horror and uneasiness. The notions entertained by the ancients respecting the soul, may receive some illustration from these principles. In dark, or twilight, the imagination frequently transforms an inanimate body into a human figure; on approaching, the same appearance is not to be found; hence they sometimes fancied they saw their ancestors; but not finding the reality, distinguished these illusions by the name of shades. Many of these fabulous narrations might originate from dreams. There are times of slumber when we are not sensible of being asleep. On this principle Hobbes has ingeniously accounted for the spectre which is said to have appeared to Brutus. 'We read,' says he, 'of M. Brutus, that at Philippi, the night before he gave battle to Cæsar, he saw a fearful apparition, which is commonly related by historians as a vision; but, considering the circumstances, one may easily judge it to have been but a short dream. For sitting in his tent, pensive and troubled with the horror of his rash act, it was not hard for him, slumbering in the cold, to dream of that which most affrighted him; which fear, as by degrees it made him wake, so it must needs make the apparition by degrees to vanish; and, having no assurance that he slept, he could have no cause to think it a dream, or any thing but a vision.'—The well-known story told by Clarendon, of the apparition of the duke of Buckingham's father, will admit of a similar solution. There was no man in the kingdom so much the subject of conversation as the duke; and from the vileness of his character, he was very likely to fall a sacrifice to the enthusiasm of the times. Sir George Villiers is said to have appeared to the man at midnight; therefore there is the greatest probability that the man was asleep; and the dream affrighted him, made a strong impression, and was likely to be repeated. Dr. Doddridge's narrative of the conversion of Colonel Gardiner, supplies an apparition-story of extraordinary pretensions, and is unquestionably of an exciting tendency; and Mr. Archdeacon Coxe's account of Marshal Saxe at Berlin, is perhaps as respectable a narrative, for the strength of its evidence as any yet supplied upon this subject.

This is a subject, after all, admitting no a priori reasoning; and one respecting which the actual truth or error of the popular belief will never be demonstrated. It is a question of testimony and of fact, involving phænomena, as it is alleged, with which our acquaintance is very limited. It is not to be forgotten that Luther, Baxter, and Dr. Samuel Johnson, contended for the really spiritual character of some of these appearances; nor, on the other hand, that fever and intoxication leave behind them a diseased imagination, under the effects of which, voices are heard and objects seen, that assuredly have no outward existence. Even intense study, that 'suspension of all thought,' as Mr. Coleridge calls it, 'in the perplexity of thinking,' sedentary habits, and the deranged digestion and nervous irritability often accompanying them, have a tendency to produce the same effects. 'It would appear incredible,' says this last gentleman, 'to persons not accustomed to these subtle notices of self-observation, what small and remote resemblances, what mere hints of likeness, from some real external object, especially if the shape be aided by color, will suffice to make a vivid thought consubstantiate with the real object, and derive from it an outward perceptibility. Even when we are broad awake, if we are in anxious expectation, how often will not the most confused sounds of nature be heard by us as articulate sounds? For instance, the bubbling of a brook will appear for a moment the voice of a friend, for whom we are waiting, calling out our own names, &c.'—'A lady once asked me, if I believed in ghosts and apparitions?' I answered with truth and simplicity, 'No, Madam, I have seen far too many myself.' —*Coleridge.*

APPARITOR. The officer who serves the process in the Spiritual Court.

> Was it to go about indeed with a band of working officials, with cloak-bags full of citations, and processes to be served by a corporation of griffin-like promoters and *apparitors*.
>
> *Milton. Reform in England*, book i.

Apparitor, in some ancient English laws, a judge or justice.

Apparitor Comitatus, was formerly an office for which the sheriffs of Buckinghamshire had a considerable yearly allowance; and in the reign of queen Elizabeth there was an order of court for making that allowance.

APPARITORES, in antiquity; from *apparco*, to appear, or be at hand; public officers, so called because they were always at hand to wait upon the magistrates. Under this general name were included the Scribes, Accensi, Præcones, &c. They also acted as lictors to the priests, according to an inscription in the Appian way, Apparitori Pontificum Parmulario.—*Cic. in Verr.* act. iii. c. 78. *Serv. in Virg. Æn.* l. xii. v. 850.

APPAY', Ital. *appagare*; Fr. *payer*, to satisfy. The intensive of to pay, used particularly in Chaucer.

> Be ghoure maneris withoute couetise *apaied* with present thingis. *Wiclif. Ebrewis*, ch. xiii.

Ye shuld have warned, or had I gon,
That he you had an hundred frankes paide,
By redy token: and held him evil *apaide*,
For that I to him spake of chevisance.
Chaucer. Shipmannes Tale. vol. ii. p. 4.

Yet when at last thy toils but ill *apaid*
Shall dead thy fire, and damp its heavenly spark,
Thou wilt be glad to seek the rural shade,
There to indulge the muse, and nature mark.
Thomson. Castle of Indolence, canto i.

APPE'ACH, APPEACH'MENT, APPEACH'ER. } See IMPEACH.

As if there were twoo men that had sworne the death of another, because they cannot brynge it aboute, they imagyne how thei may bryng him to all the shame and vexacion that they can, and thereupon they *apeache* him of hiresye.
Sir Thos. More's Works.

For the lawe is not the authour of synne, bvt the vtterer and *apeacher* therof, wherof before the lawe gyuen we wer in manner ignorant.
Udall. Romaynes, ch. vii.

He did, amongst many others, *appeach* Sir William Stanley, the lord chamberlain. *Bacon's Henry VII.*

Were he twenty times
My son, I would *appeach* him.
Shakspeare's Richard II.

Disclose
The state of your affection; for your passions
Have to the full *appeached*. *Shakspeare.*

For, when Cymocles saw the foul reproach,
Which them *appeached*; prick'd with guilty shame
And inward grief, he fiercely gen approach
Resolv'd to put away that lordly shame.
Faerie Queene.

This binds thee, then, to further my design;
As I am bound by vow to further thine:
Nor canst, nor dar'st thou, traitor, on the plain,
Appeach my honor, or thine own maintain,
Since thou art of my council, and the friend
Whose faith I trust, and on whose care depend.
Dryden's Pal. and Arcite. book i.

APPEAL', *v.* & *n.* APPEAL'ER, APPEAL'ABLE, APPEAL'ANT, APPEAL'MENT, APPEL'LANT, *n.* & *adj.* APPEL'LATE, APPEL'LATION, APPEL'LATIVE, *n.* & *adj.* APPEL'LATIVELY. } *Appello*, to call to or upon. To call for help, or legal protection; to apply to superior judges; to address discourse to, supplicate, accuse. An appellant is also one who challenges another to fight. Appellation, though formerly used for appeal, now only means a name.

That dare no counsaile auaile,
The pledour and the plee shall faile,
The sentence of that ylke daie
Maie none *appele* sette in delaie.
Gower. Con. A. book ii.

And he [Richard the 2d] framed there also an *appellation*, and there it was ordeyned that certeine *appellers* should lay vntó them high treason in open parliament. *Grafton*, p. 464.

To *appeal* is lawful, from the first cogitations of sin to their second; and from the nearer times to more times farther off. *Bacon's Essays.*

Except where ordinary means fail us, it is no *appealing* to the immediate help of God; we may not knock to the postern, but where the common gate is open. *Hall's Contemplations.*

The casting up of the eyes, and lifting up of the hands, is a kind of *appeal* to the Deity, the author of powers. *Bacon.*

This is the day appointed for the combat;
And ready are th' *appellant* and defendant,
Th' armourer and his man, to enter the lists.
Shakspeare.

The duke's unjust,
Thus to retort your manifest *appeal*,
And put your trial in the villain's mouth,
Which here you come to accuse. *Id.*

Hast thou, according to thy oath and bond,
Brought hither Henry Hereford, thy bold son;
Here to make good the boist'rous late *appeal*
Against the duke of Norfolk? *Id.*

One but flatters us,
As well appeareth by the cause you come;
Namely, t' *appeal* each other of high treason. *Id.*

Lords *appealants*,
Your differences all shall rest under guage,
Till we assign you to your days of trial. *Id.*

This ring
Deliver them; and your *appeal* to us,
There make before them. *Id. Henry VIII.*

Our reason prompts us to a future state,
The last *appeal* from fortune and from fate,
Where God's all-righteous ways will be declar'd.
Dryden.

Nor shall the sacred character of king
Be urg'd, to shield me from thy bold *appeal*;
If I have injur'd thee, that makes us equal. *Id.*

There are distributors of justice, from whom there lies an *appeal* to the prince. *Addison.*

He that shall use the *appellative* name for God, either in the Scythian, Egyptian, or any other language which he hath been brought up in, will not offend. *Cudworth's Intellectual System.*

Long have we sought t' instruct and please mankind
With studies pale, with midnight vigils blind;
But thank'd by few, rewarded yet by none,
We here *appeal* to thy superior throne;
On wit and learning the just prize bestow,
For fame is all we must expect below.
Pope's Temple of Fame.

They that love to talk of the mercies of the Lord, and to recount his good things, cannot but have observed that God delights to be called by such *appellatives* which relate to miserable and afflicted persons.
Jeremy Taylor.

Force, or a declared sign of force, upon the person of another, where there is no common superior on earth, to *appeal* to for relief, is the state of war; and it is the want of such an *appeal* gives a man the right of war, even against an aggressor, though he be in society, and a fellow subject. *Locke.*

Words and names are either common or proper. Common names are such as stand for universal ideas, or a whole rank of beings, whether general or special; these are called *appellatives*: so fish, bird, man, city, river, are common names; and so are trout, eel, lobster; for they all agree to many individuals, and some to many species. *Watts's Logic.*

A busy-headed man gave first light to this *appeachment*; but the earl did avouch it. *Hayward.*

APPEAL, in law, the removal of a cause from an inferior to a superior court or judge, when a person thinks himself aggrieved by the sentence of the inferior judge. Appeals lie from all the ordinary courts of justice to the House of Lords. In ecclesiastical cases, if an appeal is brought before a bishop, it may be removed to the archbishop; if before an archdeacon, to the court of arches, and thence to the archbishop; and from the archbishop's court to the king in chancery. Appeal, in common law, also denotes the accusation by a private subject against another, for some heinous crime; demanding punishment

rather on account of the particular injury suffered, than for the offence against the public. This private process, for the punishment of public crimes, had probably its original in those times, when a private pecuniary satisfaction, called a weregild, was constantly paid to the party injured, or his relations, to expiate enormous offences, and was derived to the English, in common with other northern nations, from their ancestors the ancient Germans: among whom, according to Tacitus, luitur homicidum certo armentorum ac pecorum numero; recipitque satisfactionem universa domus. In the same manner by the Irish law, in case of murder, the brehon or judge was used to compound between the murderer and the friends of the deceased who prosecuted him, by causing the malefactor to give unto them, or to the child or wife of him that was slain, a recompence which they called an eriach. In the laws of Henry I we have an account of what offences were redeemable by weregild, and what were not so. As therefore, during the continuance of this custom, a process was certainly given, for recovering the weregild by the party to whom it was due; it seems that, when these offences by degrees grew no longer redeemable, the private process was still continued, in order to insure the infliction of punishment upon the offender, though the party injured was allowed no pecuniary compensation for the offence. But though appeals were thus, in the nature of prosecutions for some atrocious injury, committed more immediately against an individual, yet it was also anciently permitted, that any subject might appeal another subject of high treason, either in the courts of common law, or in parliament, or (for treasons committed beyond the seas) in the court of the high constable and marshal. The cognizance of appeals in the latter long continued in force; and so late as 1631, there was a trial by battle awarded in the court of chivalry, on such an appeal of treason: but that in the first was virtually abolished by the statutes 5 Edw. III. c. 9. and 2 Edw. III. c. 24.; and in the second expressly by the statute 1 Hen. IV. c. 14. So that the only appeals, until recently, in force, for things done within the realm, were appeals of felony and mayhem.

But this appeal, which had almost fallen entirely into disuse, has been recently abolished by statute 59. Geo. 3. c. 46. intitled, 'An act to abolish appeals of murder, treason, felony, or other offences, and wager of battel, or joining issue and trial by battel, in writs of right,' passed 22d June, 1819, which, after reciting, 'Whereas appeals of murder, treason, felony, and other offences, and the manner of proceeding therein, have been found to be oppressive; and the trial by battel in any suit, is a mode of trial unfit to be used; and it is expedient that the same should be wholly abolished;' enacts, 'that from and after the passing of this act, all appeals of treason, murder, felony, or other offences, shall cease, determine, and become void; and that it shall not be lawful for any person or persons, at any time after the passing of this act, to commence, take, or sue appeal of treason, murder, felony, or other offence, against any other person or persons whomsoever, but that all such appeals shall, from henceforth, be utterly abolished; any law, statute, or usage, to the contrary in any wise notwithstanding.' 'And be it further enacted, that from and after the passing of this act, in any writ of right now depending, or which may hereafter be brought, instituted, or commenced, the tenant shall not be received to wage battel, nor shall issue be joined nor trial be had by battel in any writ of right; any law, custom, or usage to the contrary notwithstanding.'

The last case of an appeal of murder was that of Ashford v. Thornton, and as rather remarkable, we subjoin it from Burns:

In Michaelmas Term, 55. Geo. III. 1817, William Ashford, the eldest brother and heir at law of Mary Ashford, spinster, deceased, brought a writ of appeal against Abraham Thornton, for the murder of his said sister, of which offence the defendant had been tried and acquitted at Warwick summer assizes preceding, under circumstances of strong suspicion, (though not absolutely conclusive), of his having ravished, and afterwards thrown her into a pit of water where the body was very recently found. The appellee, upon being called upon to plead, pleaded 'not guilty; and I am ready to defend the same by my body:' and thereupon taking his glove off, he threw it upon the floor of the court. The appellant afterwards delivered in a counter plea, to which there was a counter plea, a general demurrer, and joinder therein. After very long and elaborate arguments, the court of King's Bench held that the appellee had a right to wage his battel, the appellant not having brought himself within any of the established cases which entitle him to decline the wager of battel; namely, where the appellant is an infant, or a woman, or above sixty years of age, or where the appellee is taken within the mainour, or has broken prison, or where great and violent presumptions of guilt exist against the appellee, which admit of no denial or proof to the contrary. The appellee was afterwards discharged.

APPEAR', *v.* & *n.*
APPEAR'ER,
APPEAR'ING,
APPEAR'INGLY.

Lat. *appareo*, from *ad* and *pareo*; Gr. παρ-ειμι, to be near to, or present. To be in sight, or visible, to be the object of perception, to seem, to look as if possessing the qualities, &c. ascribed.

Kindly heauen when merry weather is aloft *appeareth* in mannes iye of colour in blewe, steadfastnesse in peace, betokening within and without.

Chaucer. Test of Love, fol. 306. ch. ii.

To whom in slepe the wonted godheds forme
Gan ay *appere*, returning in like shape
As semed him: and gan him thus aduise,
Like unto Mercury in voice, and hue
With yelow bushe, and comely lymmes of youth,

Surrey.

In strait estate *appear* thou hardy and stout.

Earl of Surry's Poems.

PER. Here will I wash it in the morning's dew,
Which she on every little grass doth strew
In silver drops against the sun's *appear*,
'Tis holy water, and will make me clear.

Beau. and Fletch. Faithful Shepherdess.

Outward *appearances* are deceitful guides to our judgment or affections. *Hall's Contemplations.*

In yonder nether world where shall I seek
His bright *appearances*, or footstep trace. *Milton.*

'Twas in the dead of night, when sleep repairs
Our bodies worn with toils, our minds with cares,
When Hector's ghost before my sight *appears*;
A bloody shroud he seem'd, and bath'd in tears,
Unlike that Hector who return'd from toils
Of war, triumphant with Æacian spoils. *Dryden.*

The peacock in all his pride does not display half the color that *appears* in the garments of a British lady, when she is either dressed for a ball or birth-day. *Spectator*, No. 265.

Elegance, the most undoubted offspring and visible image of fine taste, the moment it *appears*, is universally admired. *Usher.*

'Tis listening fear, and dumb amazement all,
When to the startled eye the sudden glance
Appears far south eruptive through the clouds;
And following slower, in explosion vast,
The thunder raises his tremendous voice. *Thomson.*

Who can paint
Like nature? Can imagination boast,
Amid his gay creation, hues like these?
And can he mix them with that matchless skill,
And lay them on so delicately fine,
And lose them in each other as *appears*
In every bud that blows? *Id. Spring.*

When glory-like the dazzling eagle stood,
Perch'd on my beaver in the Granic flood,
When Fortune's self my standard trembling bore,
And the pale Fates stood frighted on the shore,
When each immortal on the billows rode,
And I myself *appear'd* the leading god.
Lee's Alexander the Great, act ii.

In the mid-air *appeared* Æolus, busy, restless, and vehement, his wrinkled and morose countenance, his hoarse and threatening voice, his shaggy brows, which hung down to his beard, and the sullen austerity that gleamed in his eyes, awed the hurricane to silence, and drove back the clouds to the horizon.
Hawkesworth's Telemachus.

'Tis granted, and no plainer truth *appears*,
Our most important are our earliest years;
The mind impressible and soft, with ease
Imbibes, and copies what she hears and sees,
And through life's labyrinth holds fast the clue
That education gives her, false or true. *Cowper.*

The poor worm
Shall prove her contest vain. Life's little day
Shall pass and she is gone—while I *appear*
Flush'd with the bloom of youth through heaven's
eternal year. *Mason on Truth.*

APPEARANCE, in law, signifies a defendant's ing a common or special bail, on any process ued out of a court of judicature.

APPEARANCE, in perspective, the representa- n or projection of a figure, body, or like object, on the perspective plane.

APPEARANCE DIRECT, in optics, the view or ht of any object by distinct rays; without her refraction or reflection.

APPEARANCES, in astronomy, &c. are more ually called phænomena and phases.

APPEASE', APPEAS'ER, APPEASE'MENT, APPEAS'ABLE. } Fr. *appaiser*; to make peace, to pacify. To calm, allay, still, quiet, moderate, soothe.

But father, now ye sitten here
In loue's stede I you beseche
That some ensample ye me teche
Wherof I maie my selfe *appease*.
Gower. Con. A. book iii.

By his council he *appeaseth* the deep, and planteth nds therein. *Ecclus.* xliii. 23.

England had no leisure to think of reformation, till the civil wars were *appeased*, and peace settled.
Davies on Ireland.

So Simon was *appeased* towards them, and fought no more against them. 1 *Mac.* xiii. 47.

O God! if my deep prayers cannot *appease* thee, yet execute thy wrath on me alone.
Shakspeare. Richard III.

The rest shall hear me call, and oft be warn'd
Their sinful state, and to *appease* betimes
Th' incensed deity. *Milton.*

Who taught the parrot human notes to try,
Or with a voice endued the chattering pie;
'Twas mighty want; fierce hunger to *appease*:
Want taught their masters, and their masters these.
Dryden.

The rest
They cut, in legs and fillets, for the feast;
Which drawn and served, their hunger they *appease*.
Id.

APPEASING REMEDIES, in medicine, are those which assuage the pain in a disease, and give the patient some rest, and at the same time contribute to the cure. These amount to the same with what we otherwise call anodynes, &c.

APPELLANTS, in church history, those among the French clergy, who refused to subscribe the bull unigenitus, issued by Clement XI. in 1713, and appealed from it, either to the pope better informed, or to a general council. The French bishops, priests, monks, and even nuns, were divided into appellants and non-appellants. The Jansenists and their followers were generally appellants.

APPELLATIONS. Nothing can be more foreign to the original meaning of many words and proper names, than their present appellations, frequently owing to the history of those things being forgotten, or an ignorance of the language in which they were expressed. Who, for instance, would suppose that the head on the French coast, near Calais, called by our seamen Blackness, could be so entitled from its French name of Blanc Nez, or the White Headland? Henry VIII. having taken the town of Boulogne in France, the gates of which he brought to Hardes in Kent, the flatterers of that reign highly magnified this action, which, like Porto Bello, became a popular subject for signs; and the port or harbour of Boulogne, called Boulogne Mouth, was accordingly set up at a noted inn in Holborn: the name of the inn long out living the sign and fame of the conquest, an ignorant painter, employed by a no less ignorant landlord to paint a new one, represented it by a bull and a large gaping human mouth (answering to the vulgar pronunciation of Bull and Mouth). The same piece of history gave being to the bull and gate, originally meant for Boulogne gate, and represented by an embattled gate or entrance into a fortified town. The Spectator has explained the sign of the Bell Savage inn plausibly enough, in supposing it to have been originally the figure of a beautiful female found in the woods, called in French la belle sauvage. But another reason has since been assigned for that appellation, namely, that the inn was once the property of Lady Arabella Savage, and familiarly called Bell Savage's inn, probably represented by a bell and a savage or wild man, which was a rebus for her name; rebusses being much in fashion in the sixteenth century. The

appellation of Lombard was formerly all over Europe considered as synonymous to that of usurer. At the institution of yeomen of the guards, they used to wait at table on all great solemnities, and were ranged near the buffets; this procured them the name of buffetiers, not very unlike in sound to the jocular appellation of beefeaters, now given them; though probably it was rather the voluntary misnomer of some wicked wit, than an accidental corruption arising from ignorance of the French language. The opprobrious title of bum-bailiff, so constantly bestowed on the sheriffs' officers, is, according to Judge Blackstone, only the corruption of bound bailiff, every sheriff's officer being obliged to enter into bonds and to give security for his good behaviour, previous to his appointment. A cord wainer seems to have no relation to the occupation it is meant to express, which is that of a shoe-maker. But cordonier, originally spelt cordaunier, is the French word for that trade; the best leather used for shoes coming originally from Cordua in Spain. Spanish leather shoes were once famous in England. Of a piece with these corrupted appellations, is that of the usual proclamation of 'O yes, O yes!' in our courts of law, commanding silence; which is a corruption of the French word Oyez, listen, and has been retained ever since the pleadings were held in that language.

APPELLEE, in the civil law, properly belongs only to the judge before whom the appeal is brought.

APPEND', APPEN'DAGE, APPEN'DANCE, APPEN'DANT, *n.* & *adj.* APPEN'DENCY, APPEN'DICATE, APPENDICA'TION, APPEN'DIX. — Lat. *appendo; ad*, and *pendo*, to hang to, to weigh. To hang, fix, or fasten to.

Modesty is the *appendage* of sobriety, and is to chastity, to temperance, and to humility, as the fringes are to a garment. *Taylor's Rule of Living Holy.*

The plainest truth and purity of religion is a thing that seldom pleaseth and suiteth to the curiosity and appetite of men: they are always fond of something annexed or *appendicated* to religion to make it pleasing to their appetite. *Hall's Contemplations.*

The French tongue hath divers dialects, viz. Picardy, that of Jersey and Guernsey, *appendixes* once of Normandy. *Howell's Letters.*

He has too much good sense, taste, and talent, to set his mind upon ribands, stars, titles, and other *appendages*, and idols of rank.

Sheridan's Character of Pitt.

APPENDICULÆ ASTERIARUM, wires of asteriæ, a name given by the writers on natural history, to certain small branches which are placed in a circular order at different distances upon the column of the asteriæ.

APPENDITIA, the appendage of an estate.

APPENDIX, in literature, a treatise or supplement added at the end of a work, to render it more complete

APPENNINES, a chain of mountains in Italy, beginning near mount Apio, one of the maritime Alps in the territory of Genoa, and which after running eastward for a considerable way, traverse Italy in its whole length, from north to south, dividing it east and west into nearly equal parts. Near the end of their course they separate into two branches, one of which advances to the south-east to Capo di Leuca, in the Terra di Otranto, and the others westward to the strait of Messina. This great chain receives different appellations in its progress: in the state of Genoa it is called Monte Semola and Monte Bergera; on the confines of Nice, Monte Acuto, &c. The lesser groups connected with the Appennines have been classed by modern geologists into four divisions. The first lies between the valleys of the Arno, the Chiano, and the Tiber, and occupies the whole of the ancient Senese, with a part of St. Peter's patrimony. It receives the name of the Sub Appennino di Toscana, and consists of three distinct groups standing on the same base. The second division is called the Sub Appennino Romano, and has the valleys of the Salso, the Velino, and the Nera to the north, that of the Tiber to the west, and those of the Liri and the Garigliano to the south. It is of considerable length, and terminates at Capo di Gaeta. The country around Mount Vesuvius, comprising the volcanic islands of Ischia, Ponza, and others, forms the Sub Appennino Vesuviano. Lastly, Mount Gargano, which rises abruptly on the Adriatic above the surrounding plains, has been not unfitly denominated the Sub Appennino Della Puglia. Many of these mountains are either extinct or expended volcanoes, but they are in general of less elevation than the Alps, and covered with trees to their very tops. The snow and ice on the highest ridges furnish the inhabitants of Naples with a cooling draught during the violent heats of summer; and it is from one part or other of the Appennines that almost all the rivers by which Italy is watered take their rise. The Appennines gave name to a department in the ci-devant French empire, which comprised the eastern part of the territory of Genoa with the district of Bobbio, in the duchy of Parma. It contained in 1810, 214,746 inhabitants.

'In point of general scenery,' says Mr. Eustace, 'the district through which the Appennines pass is nowhere exceeded. Its mountains present every variety of shape and magnitude, of rugged precipices, woody declivities, snowy summits, winding bases, and all the possible materials of picturesque beauty. Even the plains are varied by gentle swells and bolder elevations; while the extraordinary purity of the atmosphere, and consequent brightness of the light, give a distinctness to every object, which cannot be conceived by those who are accustomed to the dimness of a vapory sky. Its views, in short, we are assured by the concurring testimony of the most intelligent observers, never disappoint the traveller, or fall short of his expectations. The highest picturing of the imagination, the brightest descriptions of poetry do not surpass the effect produced by viewing the vale of Clitummus, the falls of the Anio, the banks of the Nar, the waters of Tiber, the groves of Albano, the plains, hills, coasts, and bays of Campania Felix.'

APPENSA, or APPENDED REMEDIES, such as are outwardly applied, by hanging about the

neck. The word comes from ad, and pendo, I hang to. Such are amulets, necklaces, phylacteries, &c.

APPENZELL, a canton in Switzerland, environed on all sides by that of St. Gall. The principal river by which it is watered is the Sitter. It contains eight large villages and a number of scattered hamlets; the whole divided into twenty-three parishes, nine of which belong to the inner rood or company, having 126 square miles and 16,000 inhabitants; and twenty to the outer rood, with 200 square miles, and 39,414 inhabitants. The former division is Catholic, the latter Calvinist. It was formerly subject to the abbey of St. Gall, from whose yoke, however, the inhabitants succeeded in freeing themselves, and joined the Swiss confederacy in 1452; but it was not recognised as the thirteenth canton till 1513. Each of these roods or divisions of the canton has its own constitution and magistrates, and is entirely independent. The form of government is a democracy; the supreme power being vested in the common council, which meets annually in April, and in which all males above the age of sixteen have a right to sit and vote. Here each rood chooses its own chief magistrate, who remains in office for two years. The inhabitants of the inner rood subsist chiefly by the rearing of cattle; those in the outer by the manufacture of linen, muslin, and other fine cotton stuffs. The annual expense of the administration is very trifling, not £200 sterling a-year for the whole canton. The late wars have been very destructive of the prosperity of this canton, which was formerly reckoned among the most opulent of Switzerland. In regard to natural aspect Appenzell is singularly wild and romantic, consisting of a continued series of hills and dales, valleys and mountains, the summits of which are covered with luxuriant pastures. Of the two roods, however, the outer is by far the more mountainous.

APPENZELL, the principal town or village of the canton, is seated on the Sitter, and has a population of 3000. It owes its rise to a chapel built here in 647 by the abbot of St. Gall, which had the name of Abtszelle, or Abbot's Cell, metamorphosed, by an easy transition, into its present name. Here are many manufactures and bleach fields for linen. Forty miles east of Zurich.

APPERCE'IVE, APPERCEI'VING, APPERCEP'TION. Fr. *appercevoir*; Lat. *percipio*; to perceive; the intensive or more forcible word for to perceive. See PERCEIVE.

With so glad chere his gestes she receiveth,
And conningly everich in his degree,
That no defaute no man *apperceiveth*,
But ay they wondren what she might be.
Chaucer. The Clerkes Tale, bk. vi. p. 362.

Right to the world's end, as that it were,
When *apperceived* had she this, she cry'd,
A thogh she through girt had be with a spere.
Browne's Shepherd's Pipe, Ec. i.

The philosopher [Lebnitz] makes a distinction between perception and what he calls *apperception*, the first is common to all monads, the last proper to the higher orders, among which are human souls.

APPER'IL. A peril. See PERIL.

Now don constable,
I am to charge you in her majesty's name,
As you will answer it at your *apperil*,
That forthwith you raise hue and cry in the hundred,
For all such persons as you can despect,
By the length and breadth of your office; for I tell you,
The loss is of some value; therefore look to 't.
Ben Jonson's Tale of a Tub, act ii.

APPERTAIN, APPERTAIN'MENT, APPERTEN'ANTE, or APPUR'TENANCE, APPER'TISCENT, or APPUR'TENANT, *n.* & *adj.* Lat. *ad pertineo*, which is compounded of *per*, by, and *teneo*, to hold. See PERTAIN. To belong to, to bear a relation to.

The father, t' whom (in heav'n supreme)
Kingdom, and power, and glory *appertain*,
Hath honor'd me according to his will.
Paradise Lost.

Who values the fortune of him that is brought forth upon the stage to act the part of a prince though he be attired there, and attended as such, hath all the garb and ceremony, the ensigns and *appurtenances* of majesty, about him? *Barrow's Sermons.*

And they roasted the passover with fire, as *appertaineth*; as for the sacrifices, they sod them in brass pots. 1 *Esdras.*

Both of them seem not to generate any other effect but such as *appertaineth* to their proper objects and senses. *Bacon.*

It is expected, I should know no secrets
That *appertain* to you.
Shakspeare. Julius Cæsar.

You know, how apt our love was to accord,
To furnish him with all *appertinents*,
Belonging to his honor. *Id. Henry V.*

All the other gifts *appertinent* to man (as the malice of this age shapes them), are not worth a gooseberry. You that are old consider not the capacities of us that are young. *Id. Henry IV.* part ii.

AP'PETE, AP'PETENCE, AP'PETENT, AP'PETENCY, AP'PETIBLE, APPETIBIL'ITY, AP'PETITE, *v.* & *n.* APPETI'TION, AP'PETITIVE. Lat. *appeto*; to seek after, from *ad* and *peto*, to seek. To wish for, and endeavour to obtain. Appetite is the natural desire applied to the concupiscible faculty, generally, but particularly to the desire of food.

Let take a cat and foster hire with milke,
And tendre flesh, and make hire couche of silke,
And let hire see a mous go by the wall,
Anon she weiveth milke and flesh and all,
And every deintee that is in that hous,
Swiche *appetite* she hath to eat the mous.
Chaucer. Manciple's Tale.

For certainly our *appetites* here,
Be it of werre, or pees, or hate, or love,
All is this ruled by the sight above.
Id. The Knightes Tale, vi. p. 67.

As matire *appeteth* forme alwaie,
And from forme to forme it passen may.
Id. The Legend of Good Women, fol. 205, ch. ii.

But in my deske, what was there to accite,
So ravenous and vast an *appetite*?
Ben Jonson's Execration upon Vulcan

When fierce temptation seconded within
By traitor *appetite*, and armed with darts,
Tempered in hell invades the throbbing breast,
To combat, may be glorious, and success
Perhaps may crown us, but to fly is safe. *Cowper.*

Power being the natural *appetite* of princes, a limited monarch cannot gratify it. *Swift.*

The gusts of *appetite*, the clouds of care,
And storms of disappointment, all o'erpast,
Henceforth no earthly hope with heav'n shall share
This heart, where peace serenely shines at last.
Beattie.

Vice, and her dependants, are impudent and fraudful, insinuating and officious, skilful in dissimulation, and ready to renounce all principles, and to violate every tie, when it becomes necessary to the gratification of the *appetites* of a prince.
Hawkesworth's Telemachus.

Our physical well-being, our moral worth, our social happiness, our political tranquillity, all depend on that control of all our *appetites* and passions, which the ancients designed by the cardinal virtue of temperance. *Burke.*

APPETITE; from ad, to, and peto, to crave; in medicine, is used to denote a natural periodical desire to eat and drink, in order to repair what had been wasted by the excretions of the body. A loss of appetite is called anorexia. An appetite for things not proper for food is called pica. An immoderate appetite is called bulimia. Some, however, distinguish between the βυλιμια, and canine appetite; making it the distinguishing character of the latter, that it is attended with a lientery, or other cœliacal flux.

APPIADES, in mythology, five divinities so called because their temples were at Rome near the fountains of Appius, viz., Venus, Pallas, Vesta, Concord, and Peace.

APPIAN, an eminent historian under the reign of Trajan and Adrian. He was a native of Alexandria in Egypt; whence he went to Rome, and distinguished himself so well by his forensic abilities, that he was chosen one of the procurators of the empire, and the government of a province was committed to him. His Roman history was not written in a continued series; but in separate histories of nations conquered by the Romans. His style is plain and simple, and, in the opinion of Phocius, he has shown the greatest knowledge of military affairs, and the happiest talent at describing them, of any of the historians of that time. Of all this voluminous work, there remains only the Punic, Syrian, Parthian, Mithridatic, and Spanish wars, together with those against Hannibal, the civil wars, the wars in Illyricum, and some fragments of the Gallic wars. His works have gone through several editions, the principal of which are the folio, Geneva, 1592; one in two vols. 8vo. Amsterdam, 1670; and another, printed at Leipsic in 1784, in three vols. 8vo.

APPIA VIA, an ancient highway from Rome through Capua to Brundusium, between 330 and 350 miles long. Appius Claudius, and Cæcus the Censor, A. U. C. 441, carried it from the Porta Capena to Capua; Julius Cæsar from Capua to Benevento; and Augustus thence to Brundusium. It was laid with hard stone brought from a great distance, large, and squared so exactly, as to need no cement; and it was sufficiently wide for several wagons to go abreast. Statius calls it the queen of roads. Its course is described by Horace, Strabo, and Antonine. Caius Gracchus placed stones along it, called cippi and termini, to mark the miles, afford foot passengers resting seats, and enable equestrian travellers to mount, there being then no stirrups used. Great part of this road still remains entire.

APPII FORUM, a town on the S. W. of Italy, about fifty miles south of Rome, and eighteen from the Three Taverns; where the Christians of Rome came to meet Paul in his journey from Puteoli to that metropolis. It was situated upon the Appian way, between Suessa Pometia to the N. W., and Terracina at some distance to the S. E. Horace mentions it in his account of his journey to Brundusium:

——inde forum Appii
Differtum nautis, cauponibus atque malignis.

To Forum Appii thence we steer, a place
Stuff'd with rank boatmen, and with vintners base.
Francis.

APPIN, a parish of Scotland, in Argyleshire, united to that of Lismore, the two together forming an extent of sixty-three miles in length, by ten. The population of Appin, in 1791, was 2405.

APPIUS (Claudius). See CLAUDIUS.

APPLANA, in entomology, a small species of phalæna, of the tortrix family, found at Kiel and in other parts of Europe.

APPLAUD', APPLAUD'ER, APPLAUSE', APPLAUS'IVE. *Ad, plaudo*, to clap hands to. To express approbation by any movement of the hands or feet. To clap, to praise, to approve.

DUKE. Now by the honour of my ancestry,
I do *applaud* thy spirit, Valentine,
And think thee worthy of an empress' love.
Shakspeare. Two Gentlemen of Verona.

I would *applaud* thee to the very echo,
That should *applaud* again. *Id. Macbeth.*

Sylla wept,
And chid her barking waves into attention;
And fell Charybdis murmur'd soft *applause*.
Milton.

Those that are so fond of *applause*, how little do they taste it, when they have it! *South.*

See their wide-streaming wounds! They neither came
For pride of empire, nor desire of fame,
Kings fight for kingdoms, madmen for *applause*;
But love for love alone, that crowns the lover's cause.
Dryden's Fables.

Nations unborn your mighty names shall sound,
And worlds *applaud*, that must not yet be found.
Pope.

I had the voice of my single reason against it, drowned in the noise of a multitude of *applauders*.
Glanville's Scepsis.

The most impious, if prosperous, are always *applauded*; the most virtuous, if unprosperous, are sure to be despised. *Spectator.*

Applause and admiration are by no means to be counted among the necessaries of life; and, therefore, any indirect arts to obtain them have very little claim to pardon or compassion. *Rambler.*

APPLAUSE, in antiquity, differed from acclamation, as the latter was articulate and performed with the voice, the former with the hands. Among the Romans applause was an artificial musical kind of noise, made by the audience or spectators to express their satisfaction. There were three species of applause, viz., bombus, imbrices, and testæ; the first a confused din,

made either by the hands or the mouth; the second and third, by beating on a sort of sounding vessels placed in the theatres for this purpose. Persons were instructed to give applause with skill; and there were even masters who professed to teach the art. At the end of the play a loud peal of applause was expected, and even asked of the audience, either by the chorus or the person who spoke last. The formula was spectatores plaudite, or valete et plaudite. The plausores, or applauders, were divided into chori, and disposed in theatres opposite to each other like the choristers in cathedrals, so that there was a kind of concert of applauses. Seneca has described the different modes of applauding with the hands: Aversæ inter se manus collisæ non plaudunt, sed palma cum palmâ collata, plausum facit. Et plurimum interest utrum cavæ concutiantur, an planæ et extentæ.

APPLE. Ang.-Sax. Apl, æppel; derived by Wachter from *a*, the intensive particle, and *bal*, any thing round. All the Celtic dialects call round fruits by this name, even those that are not apples in the common signification.

Whan Adam of thilke *apple* bote,
His sweete morcell was to hote.
Gower. lib. vi. fol. 127. col. 2.

Tall thriving trees confess'd the fruitful mold;
The redd'ning *apple* ripens here to gold.
Pope's Odyssey.

He instructed him; he kept him as the *apple* of his eye. *Deut.* xxxii. 10.

Cantabrian hills the purple saffron show,
Blue fields of flax in Lincoln's fenland blow;
On Kent's rich plains green hop-grounds scent the gales,
And *apple* groves deck Hereford's golden vales. *Scott.*

APPLE, the fruit of the pyrus malus. See PYRUS.

APPLE, BITTER. See COLOCYNTHIS.

APPLE ISLAND, a small uninhabited island on the south side of the river St. Lawrence, between Basque and Green Islands. The surrounding rocks make it difficult of approach.

APPLE JUICE. The juice of apples is a menstruum for iron. A solution of iron in the juice of the apples called golden rennets, evaporated to a thick consistence, proves an elegant chalybeate, which keeps well.

APPLE, MARCHASITE, so called by Dr. Grew on account of its figure, as being round except on one side, where it falls in, and having a stalk like a young apple.

APPLE, OAK, an excrescence or exudation of the juice of the oak, joined with a degree of putrefaction.

APPLE OF LOVE. See LYCOPERSICON.

APPLE-TREE; from apple and tree. The fruit of this tree is for the most part hollowed about the foot stalk; the cells enclosing the seed are separated by cartilaginous partitions; the juice of the fruit is sourish, the tree large and spreading; the flowers consist of five leaves, expanding in form of a rose. There are a great variety of these fruits. Those for the dessert are, the white juncating, Margaret apple, summer pearmain, summer greening, embroidered apple, golden reinette, summer white Colville, summer red Colville, silver pippin, aromatic pippin, the gray reinette, la haute-bonté, royal russeting, Wheeler's russet, Sharp's russet, spice apple, golden pippin, nonpareil, and l'api. Those for the kitchen use are, codling, summer, marigold, summer red pearmain, Holland pippin, Kentish pippin, the hanging body, Loan's pearmain, French reinette, French pippin, royal russet, monstruous reinette, winter pearmain, pomone violette, Spencer's pippin, stone pippin, oaken pippin. And those generally used for cider are, Devonshire royal wilding, redstreaked apple, the Whitsour, Hertfordshire underleaf, John apple See PYRUS MALUS.

APPLEBY, or APULBY, anciently ABALLABA, a town in the county of Westmoreland, pleasantly situated on the Eden, and almost surrounded by it. It was a Roman station in the time of Aurelian, and is situated on the Roman military road, which crosses the county from Stainmore to Cumberland. It is the only borough in Westmoreland, and sends two members to parliament. It has four fairs; on Whitsun Eve, Whit-Monday, the 10th of June, and the 10th of August, with a market every Saturday From the old English statutes, it appears that parliaments were formerly held in it. It was once a very considerable town, and had great privileges; but it is long ago gone to decay, and now only consists of mean houses in one broad street, which runs with an easy ascent from north to south, and at the head of which is the castle. It has two churches, a town-hall in which the assizes are held, a county-jail, and an hospital for a governess and twelve widows, founded in 165[illegible] by a daughter of lord Clifford. It is governed by a mayor, twelve aldermen, a common council, and two serjeants-at-mace, &c., and is said to have the best corn-market in these northern parts. It lies ten miles S. E. of Penrith, and 266 N. N. W. of London.

APPLECROSS, a parish of Scotland in Rosshire, which derives its name from an ancient proprietor, in memory of whom five apple trees were planted crossways, and have ever since been perpetuated by his successors. It was formerly called Comrick. A flock of forty or fifty deer are often seen together on the hills. There is a copper mine in this parish, reckoned by Mr. Williams as rich as any in the kingdom.

APPLEDORE, a small port in Devonshire, on the coast, the first harbour within the bar of Barnstable.

APPLE FLY, in natural history, the name given by authors to a small green fly found sometimes within an apple, and hatched of a worm or maggot, very frequently found infesting that fruit.

APPLEGIRTH, a parish of Scotland in Dumfrieshire. It is situated about eleven miles from Dumfries, twelve from Annan, its nearest sea-ports, and sixty from Edinburgh and Glasgow. It exports barley to Liverpool and oats to Greenock.

APPLICATION, in mathematics, the bringing one thing near to another for the purpose of measuring it. Thus a longer space is measured by the continual application of a less, as a yard

by a foot or inch. The number 24 is measured or divided by the application of 6; or the rectangle $a\,b$ applied to the line c gives $\frac{a\,b}{c}$. Application, παραβολη, a term to express the fitting of two quantities whose areas are equal but figures different, as when Euclid shows how on a given line παραβαλλειν, to apply a parallelogram, equal to a right-lined figure given. Euclid Elem. l. 6, prop. 28, &c. The application of one science to another, is the employing the rules and principles of the one for perfecting the other; as of algebra to geometry, when geometrical theorems are solved by algebraical investigations; the application of mechanics to geometry, &c.

Application, in astrology, the approach of two planets to each other.

Application, in geometry, is used either for division, for applying one quantity to another, whose areas, but not figures, shall be the same; or, transferring a given line into a circle, or other figure, so that its ends shall be in the perimeter of the figure.

Application, in theology, is used by some divines for the act whereby our Saviour transfers to us what he had earned or purchased by his holy life and death. By this application of the merits of Christ we are to be justified, and entitled to grace and glory.

APPLOT'. To scheme. See Plot.

A wise and thrifty invention, sure and well contrived, and rightly *applotted* according to every man's need, and according as they suspect his bill to amount to. *Taylor's Dissuasive from Popery.*

APPLY', Ap'plicate, Applica'tion, Ap'plicable, Ap'plicableness, Applicabil'ity, Ap'plicative, Ap'plicatory, *n.* & *adj.* Ap'plicatorily, Ap'plier, Appli'edly, Appli'ment, Appli'able, Appli'ance. Lat. *applico; ad*, and *plico*; from πλεκω, to form plaits or folds. To fold or lay one thing with another, to connect, to place in contact or juxta-position, to knit. Figuratively, to address, to have recourse to, to be constant in some employment, to fix the attention, to devote to some purpose.

A varlet running towards hastily,
Whose flying feet so fast their way *apply'd*,
That round about a cloud of dust did fly.
Spenser's Faerie Queene.

Yes, thou must die!
Thou art too noble to conserve a life
In base *appliances*.
Shakspeare.

Diseases, desp'rate grown,
By desperate *appliances* are relieved. *Id.*

Are you chaf'd?
Ask God for temperance; 'tis the *appliance* only,
Which your desire requires. *Id.*

There is no stint which can be set to the value or merit of the sacrificed body of Christ; it hath no measured certainty of limits; bounds of efficacy unto life, it knoweth none; but is also itself infinite, in possibility of *application*. *Hooker.*

Apply thine heart unto instruction, and thine ears to the words of knowledge. *Prov.* xxiii. 12.

The birds their quire *apply*; airs, vernal airs,
Breathing the smell of field and grove, attune
The trembling leaves; while universal Pan,
Knit with the Graces and the Hours in dance,
Led on th' eternal spring. *Milton.*

God at last
To Satan (first in sin) his doom *apply'd*;
Tho' in mysterious terms, judg'd as then best. *Id.*

There are but two ways of applying the death of Christ: faith is the inward *applicatory*, and if there be any outward, it must be the sacraments.
Taylor's Worthy Communicant.

What he says of the portrait of any particular person, is *applicable* to poetry. In the character there is a better or a worse likeness; the better is a panegyric, and the worse a libel. *Dryden.*

It were happy for us if this complaint were *applicable* only to the heathen world. *Rogers.*

The knowledge of salts may possibly, by that little part which we have already delivered of its *applicableness*, be of use in natural philosophy. *Boyle.*

All that I have said of the heathen idolatry, is *appliable* to the idolatry of another sort of men in the world. *South.*

If a right course be taken with children, there will not be much need of the *application* of the common rewards and punishments. *Locke.*

Every man is conscious to himself, that he thinks; and that which his mind is *applied* about, whilst thinking, is the ideas that are there. *Id.*

It is a sign of a capacious mind, when the mind can *apply* itself to several objects with a swift succession. *Watts.*

Sacred vows and mystic song *apply'd*,
To grisly Pluto and his gloomy bride. *Pope.*

His continued *application* to such public affairs as may benefit his kingdoms, diverts him from pleasures. *Addison.*

Ex nihilo nihil fit, is a maxim that *applies* itself in every case where deity is not concerned.
Cowper's Letters.

APPOGGIATURA, from appoggiare, Ital. to lean on, in music, a small note inserted by the practical musician, between two others, at some distance; or a species of ornamental note. The Italians are so accustomed to the appoggiatura that composers neglect to write it.

APPOIDIARE, in old records, to lean, or prop up.

APPOIN'T, Appoint'er, Appoint'ment. Fr. *appointer*; from the Lat. *ad punctum*, to a point. To point, to bring to a point, to settle or fix the point of time or place, to determine, to allot, to prescribe, to ordain; also to furnish in all points, to provide with all things necessary. Appointment, as applied to office or emolument, is a modern application of the word, from the French.

He said, *appoint* me thy wages, and I will pay it.
Genesis.

Now there was an *appointed* sign between the men of Israel and the liers in wait. *Judges* xx. 38.

The ways of death be only in his hands, who alone hath power over all flesh, and unto whose *appointment* we ought with patience meekly to submit ourselves. *Hooker.*

That good fellow,
If I command him, follows my *appointment*;
I will have none so near else. *Shakspeare*

The accusations against Columbus gained such credit in a jealous court, that a commissioner was *appointed* to repair to Hispaniola, and to inspect into his conduct. *Robertson.*

When any contest arises among the neighbouring states, they frequently make a common deposit of the territory in question, in the hands of Bœticans, and *appoint* them arbitrators of the dispute.
Hawkesworth's Telemachus.

APPOINTEE, a foot soldier in the French army, and distinguished before the revolution; who, for long services, received pay above private sentinels. This regulation, however, has long been suppressed, except in the regiment of French guards, where forty appointees were still retained to each company of 150 men. Till 1670 they had also captains and lieutenants, under the appellation appointees, who without residing in the regiment received their pay. See ANSPESSADES.

APPOINTEE, in heraldry, is when two or more things are placed touching each other at the points.

APPOINTMENT, denotes a pension, given by princes to persons of worth, to retain them in their service. The term was chiefly used among the French before the revolution. The kings of France gave large appointments to officers in their service. They differed from wages, in that the latter were fixed and ordinary, being paid by the ordinary treasurers, whereas appointments were annual and granted by brevet, for a time uncertain, and paid out of the privy purse.

APPOLE, a town of Hindostan, in the district of Dinagepoor, in the province of Bengal, 80 miles N. N. E. of Moorshedabad.

APPOR'TION, APPOR'TIONATENESS. } Old Fr. *apportioner*; from the Lat. *ad portionem*. To settle the share, part, or allotment, of each.

Try the parts of the body, which of them issue speedily, and which slowly; and, by *apportioning* the time, take and leave that quality, which you desire.
Bacon.

To these it were good, that some proper prayer were *apportioned*, and they taught it. *South.*

An office cannot be *apportioned* out like a common, and shared among distinct proprietors. *Coll.*

APPO'SE, or APO'SE. } Lat. *apponere*, *ad* and *pono*, to place to or near. In our usage to put questions to. It sometimes signifies opposition, but the word is altogether obsolete.

Some procure themselves to be surprised, at such times; as it is like the party, that they work upon, will come upon them: and to be found with a letter in their hand, or doing somewhat which they are not accustomed; to the end they may be *apposed* of those things, which of themselves they are desirous to utter.
Bacon.

By malign putrid vapours, the nutriment is rendered unapt of being *apposed* to the parts. *Harvey.*

APPOSAL OF SHERIFFS, is the charging them with money received on their account in the exchequer, 22 & 23 Car. II. c. 22.

APPOSER; from ad, to, and pono, to put, an examiner. In the court of exchequer there is an officer called the foreign apposer. In the office of confirmation, in the liturgy of Edw. VI. the Rubric directs the bishop, or such as he shall appoint, to appose a child; and a bishop's examining chaplain was anciently called his poser See last article.

AP'POSITE, AP'POSITELY, AP'POSITENESS, APPOSI'TION, APPOS'ITIVE. } Of the same derivation as appose, but of a different signification. Placed near, or side by side, suited, fitted, or adapted.

The duke's delivery of his mind was not so sharp, as solid and grave, and *apposite* to the times and occasions. *Wotton.*

Neither was Perkin (for his part) wanting to himself, either in gracious and princely behaviour, or in ready and *apposite* answers. *Bacon.*

Remarkable instances of this kind have been: but it will administer reflections very *apposite* to the design of this present solemnity. *Atterbury.*

We may *appositely* compare this disease, of a proper and improper consumption, to a decaying house.
Harvey.

When we come into a government, and see this place of honor allotted to a murderer; another, filled with an atheist or a blasphemer; may we not *appositely* and properly ask, 'Whether there be any virtue, sobriety, or religion, amongst such a people?'
South.

Judgment is either concerning things to be known, or of things done, of their congruity, fitness, rightness, *appositeness*. *Hale's Origin of Mankind.*

Pope's Essay on Man is the finest philosophical poem in the world; but it seems to me to do more honor to the imagination than to the understanding of its author: I mean, its sentiments are noble and affecting, its images and allusions *apposite*, beautiful, and new; its wit transcendently excellent; but the scientific part of it is very exceptionable. *Beattie.*

APPOSITION is used in physics, in speaking of bodies which derive their growth from the adjunction or union of neighbouring bodies. Most bodies of the fossil or mineral kingdom are formed by juxta-positions, or the apposition of parts brought to join and adhere to each other.

APPOSITORIUM, in chemistry, a vessel made of earthenware or glass, of a conical figure, whose biggest end receives the neck of a green retort, while the narrower is inserted into the receiver. Its use is, where a strong open fire is required, to prevent the red-hot retort, by the immediate contact of its neck, from bursting the receiver.

APPRAISE, or APPRIS'E, APPRAIS'ER, APPRAISE'MENT, or APPRIS'EMENT. } Fr. *apprecier*; to set a price; from the Lat. *ad* and *pretium*. To judge of the current value of things.

By law they (the purveyors) ought to make but one *apprisement* by neighbours in the country; by abuse they make a second *apprisement* at the court gate.
Bacon.

On poems by their dictates writ,
Critics as sworn *appraisers* sit;
And mere upholsterers in a trice,
On gems and paintings set a price.
Green's Spleen.

APPRAISERS are not a separate profession; appraising being practised by brokers of household furniture, to whom the name is chiefly applied. Upholsterers and joiners are also employed, or any person who is supposed to be skilled in the commodities which are to be appraised or valued. They are employed in cases of death, executions upon goods, or of stock to

be transferred, or divided, and are called sworn appraisers, from their taking an oath to do justice between parties. They sometimes appraise on behalf of both sides, each party agreeing to have the same appraiser; sometimes in opposition, each party choosing one or more of a side, and sometimes by commission or deputation of trustees, masters in Chancery, &c. If they value the goods too high, they shall be obliged to take them at the price appraised, stat. 11 Edw. I.

APPRECIABLE, in acoustics, opposed to inappreciable sounds. See APPRECIATION.

APPRECATION, AP'PRECATORY. Lat. *apprecor, appre-catum; ad* and *precor*, to pray to, in order to obtain one's wish. A beseeching, a praying to.

The heathen Romans entered not upon any public civil business, without a solemn *apprecation* of good success. *Bp. Hall's Art of Divine Meditation.*

APPRECIATE, APPRE'CIATION. Fr. *apprecier*. To define the value at which things should be estimated.

To the finishing of his course let every one direct his eye; and let him now *appreciate* life according to the value it will be found to have when summed up at the close. *Blair.*

APPRECIATION, in music. Our organ of hearing is unable to judge of sounds beyond a certain degree of gravity and acuteness. The octave below double C, the lowest note of the additional keys in the base of piano-fortes, is extremely difficult to tune; and the additional high notes seem more the production of wood than wire. However, the great mathematician, Euler, gives the extent of eight octaves to human perception; or from the highest appreciable sound to the lowest; but Rousseau says we seldom, in practice, exceed five octaves, the common compass of keyed instruments. There is a degree of force or loudness, which we cannot appreciate. The sound of a great bell, for instance, gives no distinct and certain tone, but a confusion of harmonies, which we cannot distinguish in the belfry from the fundamental. It is the same with a wind instrument overblown, and a voice that is forced beyond its natural power; so that those who try to sing loud with a feeble voice are always out of tune.

APPREHEND', APPREHEN'DER, APPREHEN'SIBLE, APPREHEN'SION, APPREHEN'SIVE, APPREHEN'SIVELY, APPREHE'NSIVENESS. Lat. *apprehendo;* to take hold of, to catch. Figuratively, to receive a mental impression, generally of fear, or danger.

Oh who can hold a fire in his hand,
By thinking on the frosty Caucasus?
Or cloy the hungry edge of appetite,
By bare imagination of a feast?
Or wallow naked in December snow,
By thinking on fantastic summer's heats?
Oh no! the *apprehension* of the good
Gives but the greater feeling to the worse.
Shakspeare. Richard II. act i.

Dar'st thou die?
The sense of death is most in *apprehension;*
And the poor beetle that we tread upon,
In corporal sufferance, feels a pang as great
As when a giant dies. *Id. Measure for Measure.*

In my afflictions, knowledge *apprehends*
Who is the author, what the cause and ends;
It finds that patience is my sad relief,
And that the hand that caused can cure my grief.
Quarles.

Whenever our neighbour's house is on fire it cannot be amiss for the engines to play a little on our own. Better to be despised for too anxious *apprehensions*, than ruined by too confident a security. *Burke.*

Our natural sense of right and wrong produces an *apprehension* of merited punishment, when we have committed a crime. *Blair.*

APPREHENSION, in logic, differs from notion, as the act of the mind whereby a notion is formed, differs from an act of the mind whereby we attend to a notion already formed. Apprehension is likewise used to express an inadequate and imperfect idea, in contradistinction to comprehension; and thus it is applied to our knowledge of God.

APPRENTICE, *v.* & *n.* APPREN'TISAGE, APPREN'TICEHOOD, APPREN'TICESHIP. Fr. *apprenti*, a learner; from *apprendre*, to learn; Lat. *apprehendo*, to take hold of.

Must I not serve a long *apprenticehood*
To foreign passages, and in the end,
Having my freedom, boast of nothing else
But that I was a journeyman to grief?
Shakspeare.

Love enjoined such diligence, that no *apprentice*, no, no bond slave, could ever be more ready than that young princess was. *Sidney.*

He found him such an *apprentice* as knew well enough how to set up for himself. *Wotton.*

This rule sets the painter at liberty; it teaches him that he ought not to be subject himself servilely, and be bound like an *apprentice* to the rules of his art. *Dryden's Dufresnoy.*

Him portion'd maids, *apprenticed* orphans blest,
The young who labour, and the old who rest. *Pope.*

APPRENTICE, a person bound by indenture to a tradesman, who, upon certain covenants, is to teach him his trade or mystery. Adult apprentices are sometimes taken; but the contract is generally made for and by youths of fourteen years of age and upwards.

By common law no infant or person under twenty-one years of age can bind himself apprentice so as to entitle his master to an action of covenant; which usually renders it necessary for some of his friends to be bound for him; but, by the custom of London, an infant unmarried, and above fourteen years of age, may bind himself apprentice to a freeman of London, by indenture with proper covenants; which covenants, by the custom of London, are as binding as if he had been of full age.

By a statute of Elizabeth, it was enacted that no person who had not served an apprenticeship for seven years, or served as an apprentice, should exercise any art, mystery, or manual occupation: this section of Elizabeth's act was repealed by the 54 Geo. III.; saving the customs and bye-laws of London, and of other cities, and of corporations legally established. Apprenticeship, which sometimes denotes the contract by which an apprentice is bound, and sometimes the term of his service, was unknown to the Roman law; and arose in modern times out of that system of corporations which formed so distinguishing a feature in the domestic policy

of the middle ages. The principle upon which it was founded, is obviously the notion that labor employed in mechanical trades requires more skill and experience than are requisite in husbandry. There is no Greek or Latin word that expresses the idea we attach to this term. Seven years seem anciently to have been, all over Europe, the usual term established for the duration of apprenticeships in the incorporated trades. All such incorporations were once called universities; the proper Latin name for any incorporation whatever. The university of smiths, the university of tailors, &c. are, therefore, expressions which we commonly meet with in the old charters of ancient towns. This principle of incorporation was also extended to the learned professions. Barristers, in our old law books, are called apprentices, apprentici ad legem, though their novitiate extended to sixteen years, after which they might be called to the state and degree of serjeants, servientes ad legem. And in those learned incorporations, still known by the name of universities, the term of apprenticeship was the same as that prescribed in other arts; seven years being the period allotted for a student to become a master, and for entitling him to have scholars or 'apprentices' under him,

In France, before the revolution, the duration of apprenticeships was different in different towns and in different trades. In Paris, five years was the term required in a great number; but before any person could be qualified to exercise the trade as a master, he was obliged, in many of them, to serve five years more as a journeyman. During this latter term he was called the companion of his master, and the term itself was called his companionship; a kind of anticipation of the equality that has since taken place. In Scotland there is no general law which regulates universally the duration of apprenticeships. The term differs in different incorporations. Where it is long, a part of it may be generally redeemed by paying a small fine. In most towns, too, a very small fine is sufficient to purchase the freedom of any corporation. The weavers of linen and hempen cloth, the principal manufactures of the country, as well as all other artificers subservient to them, wheelmakers, reel-makers, &c. may exercise their trades in any town corporate without paying any fine. In all towns corporate, all persons are free to sell butchers' meat upon any lawful day of the week. Three years is in Scotland a common term of apprenticeship, even in some very nice trades; and, in general, there is no country in Europe in which corporation laws are so little oppressive.

Long apprenticeships Dr. Smith considers as altogether unnecessary. Arts, which are much superior to common trades, such as those of making clocks and watches, contain no such mystery as to require a long course of instruction. The first invention of such beautiful and useful machines, indeed, and even that of some of the instruments employed in making them, must, no doubt, have been the work of deep thought and long time, and may justly be considered as among the happiest efforts of human ingenuity; but when both have been fairly invented, and are well understood; to explain to any young man, in the completest manner, how to apply the instruments and how to construct the machines, cannot well require more than the lessons of a few weeks; perhaps those of a few days might be sufficient. In the common mechanical trades, those of a few days might certainly be sufficient. The dexterity of hand, indeed, even in common trades, cannot be acquired without much practice and experience. But a young man would practice with much more diligence and attention, if, from the beginning, he wrought as a journeyman, being paid in proportion to the little work which he could execute, and paying in his turn for the materials which he might sometimes spoil through awkwardness and inexperience. His education in this way generally would be more effectual, and always less tedious and expensive. The master, indeed, would be a loser; he would lose all the wages of the apprentice, which he now saves for seven years together. In the end, perhaps, the apprentice himself would be a loser. In a trade so easily learnt he would have more competitors; and his wages, when he came to be a complete workman, would be much less than at present. The same increase of competition would reduce the profits of the master as well as the wages of the workmen. The trades, the crafts, the mysteries, would be all losers; but the public would be a gainer; the work of all artificers coming in this way much cheaper to market. See *Smith's Wealth of Nations*, book i. c. 10.

In reply to this it has been well remarked that Dr. Smith seems disposed to overrate the practical effect of these expedients, by which trades and corporations have been always endeavouring to secure special advantages to themselves. According to the nature of human society, as it is so admirably explained in Dr. Smith's Work, monopoly can never succeed on so great a scale; and, on the same principle, we may justly question if the contract between the apprentice and his master had been merely the device of corporations, whether it ever could have come into such universal use throughout Europe. Its best defence, as a system, is that almost all the mechanical trades require, throughout their various operations, such nicety and exactness, that the necessary habits are not formed by the training of years, in place of weeks or days, as stated by Dr. Smith. And it is for the troublesome superintendence of the apprentice during this period that the master exacts compensation, without which he would employ none but finished workmen. But he puts up with the awkwardness of his apprentice, because he expects to be benefited by his labor after he shall be better instructed; on the same principle that the farmer lays out his capital on the improvement of his land, in expectation of a future increase of produce. The law, indeed, takes cognisance of the contract, and enforces its fulfilment; and it may also have encumbered it with absurd regulations. But the contract itself stands independent both of law and usage, having its origin in the plainest principles of reciprocal expediency. We have considerable partialities for the system arising out of its moral

effects on a large and invaluable class of society. The apprentice becomes the adopted child of a good master. He is a family inmate; subject to restraints, and moulded into habits of obedience and virtue; as well as afforded a protection from the vices of youth, not so well to be secured in any other way. Indentures were formerly subject to a variety of duties which were imposed by successive acts, and these duties necessarily gave rise to a series of intricate enactments, which frequently occasioned much perplexity and inconvenience. By the 44 Geo. III. c. 98, s. 8, all those numerous duties were consolidated into one simple duty on the stamp, which varies from fourteen shillings to nineteen guineas, according to the premium which is paid with the apprentice. By the 43 Geo. III. c. 161, an annual duty is imposed of £1. 1*s*. on every apprentice who pays a premium above £20.

APPRESSED, in botany; appressus, pressed or squeezed close; an epithet for a leaf calyx and peduncle. Thus, folium appressum is used for a leaf, the disc of which approaches so near the stem as to seem pressed to it; calyx appressus, for a calyx that presses the peduncle; and pedunculus appressus for a peduncle close to the branch or stem.

APPRIZE', *v.* & *n.* } From *appris*, past par-
APPRIS'AL. } ticiple of the Fr. verb, *apprendre*, to learn. To inform, to give notice of.

He considers the tendency of such a virtue, or vice; he is well *apprized* that the representation of some of these things may convince the understanding, and some may terrify the conscience. *Watts.*

It is fit he be *apprized* of a few things that may prevent his mistaking. *Cheyne.*

But if *apprized* of the severe attack,
The country be shut up, lured by the scent,
On church-yard drear (inhuman to relate)
The disappointed prowlers fall. *Thomson.*

In play the chance of loss and gain ought always to be equal, at least each party should be *apprized* of the force employed against him. *Steele.*

APPRISING, in Scots law, the name of that action by which a creditor formerly carried off the estate of his debtor for payment. It is now abolished, and adjudications are appointed in place of it.

APPROACH', *v.* & *n.* } Fr. *approcher*; from
APPROACH'ER, } *proche*. Ital. *appro-*
APPROACH'ABLE, } *ciare*; to draw nigh
APPROACH'MENT. } or near, to advance.

The way to death is wide, th' *approaches* near.
Dryden's Virgil.

Comets in their *approaches* towards the earth are imagined to cause diseases, famines, and other such like judgments of God. *Denham.*

Thrice happy they beneath their northern skies,
Who that worst fear, the fear of death, despise;
Provoke *approaching* fate, and bravely scorn
To spare that life which must so soon return. *Rowe.*

The soul, considered with regard to its Creator, is like one of those mathematical lines that may draw nearer to another, for all eternity, without a possibility of touching it: and can there be a thought so transporting as to consider ourselves in these perpetual *approaches* to Him, who is not only the standard of perfection, but of happiness! *Spectator.*

Blest is the man! who dares *approach* the bower,
Where dwelt the Muses at their natal hour;
Whose steps have pressed, whose eye has mark'd afar
The clime that nursed the sons of song and war.
Lord Byron's English Bards and Scotch Reviewers.

APPROACH, in mathematics, the curve of equable approach, accessus æquabilis, was first proposed by M. Leibnitz. It is to find a curve, wherein a body descending by the sole power of gravity shall approach the horizon equally in equal times. This curve has been decided by Bernouilli, Varignon, Maupertuis, and others, to be the second cubical parabola so placed that its point of regression is uppermost.

APPROACHES, in fortification, the works thrown up by the besiegers, in order to get nearer a fortress without being exposed to the enemy's fire. See FORTIFICATION.

APPROACHING, in fowling, a term used to express such devices as are contrived for the getting within shot of shy birds. The best method of approaching is by means of three hoops tied together at proper distances according to the height of the man that is to use it, and having boughs of trees tied all around it, with cords to hang it over his shoulders; a man getting into this, conceals himself, and approaches by degrees towards his game in the form of a moving bush. Geese, ducks, and teal, quit the waters in the evening, and pass the night in the fields; but at the approach of morning they return to the water again, and even when on the water they will retire to great distances, on the approach even of a horse or cow, so that the business of the stalking horse is of little use but this device of approaching by the moving bush succeeds tolerably well with them.

APPROACHING, in gardening, the inoculating or ingrafting the sprig of one tree into another, without cutting it off the parent tree.

AP'PROBATE, *v.* } *Approbo*, from *ad* and
APPROBA'TION, } *probo*. According to Tooke
APPRO'BATORY. } from Ang.-Sax. prof-ian, to prove, to try. To accept, like, or allow after examination, to assent, to express satisfaction, to commend.

The cause of this battaill, euery man did allowe and *approbate*; and to the settynge forth of the same, promysed their industrie, labour, and all that they could make. *Hall. Henry VII.* fol. 23. ch. i.

How many now in health
Shall drop their blood in *approbation*
Of what your reverence shall incite us to. *Shakspeare.*

The wise man is happy when he gains his own *approbation*; the fool when he commends himself to the applause of those about him. *Spectator.*

APPROBATION, in civil law. It is a maxim among civilians, approbare dicitur qui non improbat. He is judged to approve who does not disapprove. By the civil law, a mere approbation of a crime after commission, does not make a person guilty; but an approbation attended with fact is equivalent to a command.

APPROBATION, in ethics, a state or disposition of the mind wherein we put a value upon, or become pleased with, some person or thing. The Epicureans will have it to be only self-interest; according to them, that which determines any agent to approve his own action is its apparent tendency to his private happiness. Others resolve approbation into a moral sense, or a principle of benevolence. Dr. Adam

Smith thinks it needless to introduce any new power of perception, in order to account for the principle of approbation; and apprehends that sympathy is sufficient to account for all the effects ascribed to this peculiar faculty. This system places virtue in utility; and accounts for the pleasure with which the spectator surveys the utility of any quality, from sympathy with the happiness of those who are affected by it. But the foundation of this, and every similar principle, can only be ascribed to education and habit; which, as they vary in different countries, sufficiently account for the various and opposite motives of approbation and disapprobation that take place among mankind.

Approbation, in literary history, is used in speaking of recommendations of books, given by persons qualified or authorised to judge of them. Those appointed to grant licences, and imprimatures, under arbitrary governments, frequently express their approbation of books. Books were formerly subjected to a licenser in England, by the 13th Car. II. c. 33, which act is long since expired; and being incompatible with the noble principles of the revolution, has never since, and we hope never will be revived.

APPROMPT', *v. Ad* and *promptus;* from *promo*, to bring out. To bring or draw out; to make ready for use.

Neither may these pleas serve only to *appromp* our invention, but also to direct our inquiry.
Bacon on Learning, book ii.

APPROPINQUATION, Appropinque'. Lat. *appropinquo*, to draw near a boundary; from *prope*, near. An approaching, progressive nearness.

There are many ways of our *appropinquation* to God.
Bp. Hall's Sermons.

The clotted blood within my hose,
That from my wounded body flows,
With mortal crisis doth portend
My days to *appropinque* an end. *Hudibras.*

APPRO'PRE, Appro'priable, Appro'priate, *v. n.* & *adj.* Appropria'tion, Appro'priately. Fr. *approprier; ad*, and *proprius;* that which is one's own, peculiar, proper, suitable, possessed by a firm, lasting, or natural claim. To appropriate, is to apply to one's own use. The adjective has acquired a relative signification derived from the principal, and means belonging to, suitable, becoming.

Wherof touchende this partie
Is rhetoric the science
Appropred to the reuerence
Of wordes that ben reasonable.
Gower. Con. A. book vii.

He doth nothing but talk of his horse, and make a great *appropriation* to his good parts, that he can shoe him himself.
Shakspeare. Merchant of Venice.

He did institute a band of fifty archers, by the name of yeomen of his guard; and that it might be thought to be rather a matter of dignity, than any matter of diffidence *appropriate* to his own case, he made an ordinance not temporary, but to hold in succession for ever. *Bacon.*

This conceit, applied unto the original of man, and the beginning of the world, is more justly *appropriable* unto its end. *Brown's Vulgar Errors.*

The heathens themselves had an apprehension of the necessity of some *appropriate* acts of divine worship. *Stillingfleet.*

Some they *appropriated* to the gods,
And some to public, some to private ends. *Roscommon.*

Marks of honor are *appropriated* to the magistrate, that he might be invited to reverence himself.
Atterbury.

APPROPRIARE ad Honorem, in law, signifies to bring a manor within the extent and liberty of an honor.

Appropriare Communam, in law, signifies to separate and enclose any parcel of land, which before was open common.

Appropriate, in law, is understood of a church or benefice, the patronage whereof is annexed to some church dignitary, who appoints a vicar to serve the cure; the patron receiving the chief produce of it. See Appropriation.

Appropriation, in the canon law, the annexing a benefice ecclesiastical to the perpetual use of a religious house or chapter. Appropriations seem to have sprung from the policy of the monastic orders, who were never deficient in subtle inventions for the increase of their own power and emoluments. At the first establishment of parochial clergy, the tithes were distributed in a fourfold division; one for the use of the bishop, another for maintaining the fabric of the church, a third for the poor, and the fourth to provide for the incumbent. When the sees of the bishops became otherwise amply endowed, they were prohibited from demanding their usual share of these tithes, and the division was into three parts only. Hence it was inferred by the monasteries, that a small part was sufficient for the officiating priest; and that the remainder might well be applied to the use of their own fraternities, (the endowment of which was construed to be a work of the most exalted piety), subject to the burden of repairing the church and providing for its constant supply. At this period, therefore, they begged and bought, for masses and obits, and sometimes even for money, all the advowsons within their reach, and then appropriated the benefices to the use of their own corporation. To complete such appropriation, the king's licence, and consent of the bishop, were usually obtained; because both the king and the bishop might at some future time have an interest, by lapse, in the presentation to the benefice; an event which can never happen if it be appropriated to the use of a corporation, which never dies. The appropriation thus made, the appropriators and their successors became perpetual parsons of the church, and must sue and be sued in all matters concerning the rights of the church, by the name of Parsons. See Parson. At the dissolution of monasteries by statutes 27 Hen. VIII. c. 28, and 31 Hen. VIII. c. 13. the appropriation of several parsonages, which belonged to these respective religious houses, amounting to more than one-third of all the parishes in England, would have been, by the rules of the common law, disappropriated, had not a clause in those statutes intervened, to give them to the king in as ample a manner as the abbots, &c. formerly held the same at the time of their dissolution. This was not without example in former reigns, for alien priories (that

is, such as were filled by foreigners only) had been dissolved and given to the crown. And from these two roots have sprung all the lay impropriations or secular parsonages now in the kingdom; they having been afterwards granted out from time to time by the crown. In modern times, that which is an appropriation in the hands of religious persons has been usually called an impropriation in the hands of the laity. It is computed that there are in England 3845 impropriations.

APPROVE', APPRO'VER, APPRO'VEDLY, APPRO'VABLE, APPRO'VAL, APPRO'VANCE, APPROVE'MENT, APPROOF'. Ang.-Sax. prof-ian, to prove, to try, and the intensive particle *a* prefixed. To testify excellence or value as the result of experiment, to think or judge favorably.

A man of his learning should not so lightly have been carried away with old wives' tales from *approvance* of his own reason. *Spenser.*

There can be nothing possibly evil, which God *approveth*, and that he *approveth* much more than he doth command. *Hooker.*

What power was that, whereby Medea saw,
And well *approved*, and praised the better course,
When her rebellious sense did so withdraw
Her feeble pow'rs, that she pursued the worse? *Davies.*

O most perilous mouths
That bear in them one and the self-same tongue
Either of condemnation or *approof!* *Shakspeare.*

I am sorry
That he *approves* the common liar, Fame,
Who speaks him thus at Rome. *Id.*

Would'st thou *approve* thy constancy? *Approve*
First thy obedience. *Milton.*

For this was all thy care
To stand *approved* in sight of God, though worlds
Judged thee perverse. *Milton.*

When past all offerings to Feretrian Jove,
He Mars deposed, and arms to gowns made yield,
Successful councils did him soon *approve*,
As fit for close intrigues as open field.
Dryden's Death of Oliver Cromwell.

Refer all the actions of this short life to that state which will never end; and this will *approve* itself to be wisdom at the last, whatever the world judge of it now. *Tillotson.*

There is a censor of justice and manners, without whose *approval* no capital sentences are to be executed. *Temple.*

Should she seem
Soft'ning the least *approvance* to bestow,
Their colours burnish, and, by hope inspir'd,
They brisk advance. *Thomson.*

APPROVEMENT, or APPROVIAMENTUM, is sometimes used in ancient writers for an improvement, or rise of the value and worth of a thing. Hence, in some ancient statutes, bailiffs of lords in their franchises are called their approvers.—Approvement is more particularly used where a man has common in the lord's waste, and the lord encloses part of the waste for himself; leaving sufficient common, with egress and regress for the commoner.

APPROVER, in common law, one that being indicted of felony, confesses of himself, and appeals or accuses one or more others to be guilty of the same; so called, because he must prove what he hath alleged in his appeal. This proof was anciently either by battle, or by the country, at the choice of the appellee; and the form of this accusation may be found in Crompt. Just. 250. But as all appeals of battle are now abolished, the approver can plead no confession at the bar; and his right to indemnity rests only on usage. According to the opinion of Judge Blackstone, an approver ought not to be prosecuted for that or any previous offence of the same degree. But it has since been decided that an accomplice has no claim to mercy beyond the offenees in which he has been connected with the prisoners, and concerning which he has previously undergone an examination, as appears from the following cases:—

George Duce, a prisoner in Nottingham gaol, for felony, was admitted king's evidence against Richard Barber, tried at the Lent assizes, 1801, for the town of Nottingham, before Graham B. for receiving stolen goods from a bleaching ground; and on his evidence, fully and satisfactorily given, Barber was convicted. Duce was of course discharged from the gaol at Nottingham; but being under a charge of horse-stealing at Derby, he was sent to the gaol of that county, and afterwards tried before the same learned judge for that offence; was convicted, and received sentence of death, with respite for transportation. But a doubt arising whether his case did not fall within that equitable claim to mercy, which is usually indulged to accomplices becoming witnesses for the crown, the question was submitted to the judges, who were unanimously of opinion, that the pardon was not to extend to offences for which the party might be liable to prosecution out of the county, and the prisoner underwent his sentence.

At Northampton Lent assizes, 1818, Thomas Lee, an accomplice, was, upon application by the counsel for the crown, taken before the grand jury, and examined as a witness on the trial of William Franklin and Abraham Cook, for a highway robbery, and conducted himself with propriety, and told the truth. On the subsequent day, the said Thomas Lee was tried and convicted of burglary. Garrow B. submitted to the judges whether it were proper to prosecute him after he had been received as a witness for the crown: the judges held, that there was no legal objection to the prosecution, nor any general rule upon the subject; and the prisoner has been transported for life.

APPROVERS OF THE KING, are those who have the letting of the king's demesnes in small manors, &c. In the statute of the 1st of Ed. V. c. 8. sheriffs are called the king's approvers.

APPROX'IMATE, *v.* & *adj.* APPROXIMA'TION, APPROX'IMANT. *Ad*, and *proximus*, nearest. To approach, to bring or come near.

Unto the latitude of Capricorn, or the winter solstice, it had been a spring; for, unto that position, it had been in a middle point, and that of ascent or approximation. *Brown's Vulgar Errors.*

The *approximations* and recesses of some of the fixed stars I speak of, suit not with the observations of some very ancient astronomers. *Derham.*

Shakspeare *approximates* the remote, and familiarises the wonderful, the event which he represents will not happen; but, if it were possible, its effects would probably be such as he has assigned. *Johnson.*

Approximation, among arithmeticians and algebraists, a continual approach nearer and nearer to the root or quantity required, while doubtful of the possibility of ever arriving at it exactly. Various methods of performing this have been given by mathematical writers, which, as it is nothing but an infinitely converging series, some come quicker, others slower towards the truth. Although by such an approximation the perfectly exact value of a quantity cannot be discovered, yet, for practice, it may be found sufficiently correct, thus $\sqrt{2} = 1{\cdot}41421356$, &c. = the approximating series $1 + \frac{4}{10} + \frac{1}{100} + \frac{4}{1000} + \frac{2}{10000} +$, &c. or supposing $x = \frac{1}{10}$, equal to the series $1 \times \frac{4}{x} + \frac{1}{x^2} + \frac{4}{x^3} + \frac{2}{x^4}$, +&c. $= x + 4x^{-1} + x^{-2} + 4x^{-3} + 2x^{-4} +$, &c. Approximation is probably most simple and most generally performed by the rule of Double Position, or, as some call it, the Method of Trial and Error; but, among the numerous methods for finding the roots of pure powers, undoubtedly the best is that which was discovered by Dr. Hutton, and published in the first volume of his Mathematical Tracts, for it is not difficult to perform, and it is easily remembered. It is this: If N denote any number, out of which it is wished to extract the root whose index is denoted by r, and if n be the nearest root first taken; then shall $\frac{r+1.\,N + r-1.\,n^r}{r-1.\,N + r+1.\,n^r} \times n$ be the required root of N very nearly; or as $r-1$ times the given number added to $r+1$ times the given number added to $r-1$ times the nearest power, so is the assumed root n, to the required root very nearly. But if a root still nearer is required, this last value, thus found, is to be used for n in the same theorem, and the operation repeated with it; and so on repeating the operation as often as is necessary. Which theorem comprehends all the rational formulæ of Hadley and De Lagny.—For example, Let it be required to double the cube, or to find the cube root of the number 2. Here $r = 3$; consequently $r+1 = 4$, and $r-1 = 2$; and therefore the general theorem becomes $\frac{4N + 2n^3}{2N + 4n^3} \times n$ or $\frac{2N + n^3}{N + 2n^3} \times n$ for the cube root of N; or as $N + 2n^3 : N + n^3 :: n :$ the root sought nearly. Now, in this case, $N = 2$, and therefore the nearest root is 1, and its cube $n^3 = 1$ also: hence $N + 2n^3 = 2 + 2 = 4$, and $2N + n^3 = 4 + 1 = 5$; therefore, as $4 : 5 :: 1 : \frac{5}{4}$ or $1\frac{1}{4} = 1{\cdot}25$ the first approximation. Again, taking $n = \frac{5}{4}$, and $n^3 = \frac{125}{64}$; hence $N + 2n^3 = 2 + \frac{250}{64} = \frac{378}{64}$, and $N + n^3 = 4 + \frac{125}{64} = \frac{381}{64}$; therefore, as 378 : 381, or as $126 : 127 :: \frac{5}{4} : \frac{635}{504} = 1{\cdot}25992$, which is the cube root of 2, true in all the figures. And if $\frac{635}{504}$ be taken for a new value of n, and the process repeated, fresh numbers will arise.

The method by which Sir Isaac Newton performs the approximation of roots is this: First, take a value of the root, as near as can be discovered, by trials, either less or more; then, assuming another letter to denote the unknown difference between this and the real value, substitute the sum or difference of the approximate root or unknown letter into the equation, in place of the unknown letter or root of the equation, by which a new equation will be produced, having only the assumed small difference for its root or unknown letter; and, from this equation, the nearest value of this small assumed quantity must by every means be found. Next, for the small difference between this last value and the real one, assume another letter, and unto the last equation substitute their sum or difference, which will produce a third equation, involving the second assumed quantity, the near value of which is found as before. Carrying on the process as far as we choose, and connecting all the near values together by their proper signs, a series will be formed, approaching successively to the real value of the root of the first or proposed equation. There are various ways of finding the approximate values of the small assumed differences: the following is Sir Isaac Newton's method: The quantity sought being small, its higher powers decrease more and more, so that disregarding them will lead to no error of consequence. All the terms having in them the second and higher powers, he therefore neglects, retaining only the first power and the absolute known term; and from this simple equation he always finds the near value of the assumed unknown letter, in a manner the most concise and facile.—For example, suppose it were required to find the root of the equation $x^2 - 5x = 31$, or $x^2 - 5x - 31 = 0$: Here the root x, it is evident, is nearly $= 8$; for x therefore take $8 + z$, and substitute $8 + z$ for x in the given equation, and the terms will be thus:

$$\begin{aligned} x^2 &= 64 + 16z + z^2 \\ -5x &= -40 - 5z \\ -31 &= -31 \\ \text{the sum is } & -7 + 11z + z^2 = 0. \end{aligned}$$

Then, rejecting z^2, it is $11z - 7 = 0$, and $z = \frac{7}{11} = {\cdot}6363$, &c. or $= 6$ nearly.

Assume now $z = {\cdot}6 + y$: then

$$\begin{aligned} z^2 &= {\cdot}36 + 1{\cdot}2y + y^2 \\ 11z &= 6{\cdot}5 + 11y \\ -7 &= -7 \\ \text{the sum } & -{\cdot}04 + 12{\cdot}2y + y^2 = 0, \end{aligned}$$

where $y = \frac{{\cdot}04}{12{\cdot}2} = {\cdot}003278$ nearly.

Assume $y = {\cdot}003278 - v$: then

$$\begin{aligned} y^2 &= {\cdot}000010745284 - {\cdot}006556v + v^2 \\ 12{\cdot}2y &= {\cdot}0399916 \quad\quad - 12{\cdot}2 - v \\ -{\cdot}04 &= -{\cdot}04 \end{aligned}$$

the sum ${\cdot}000002345284 - 12{\cdot}206556v + v^2 = 0$,

where $v = \frac{{\cdot}000002345284}{12{\cdot}206556} = {\cdot}000000192133$.

Hence then, collecting all the assumed differences, with their signs, it is found that $x = 8 + y - v = 8 + {\cdot}6 + {\cdot}003278 - {\cdot}000000192133 = 8{\cdot}6003277607867$ the root of the equation required, by Newton's method. In another ex-

ample, taking the cubic equation $y^3 - 2y - 5 = 0$, he proceeds thus:

y is nearly $= 2$; take it therefore $y = 2 + p$;

then $y^3 = 8 + 12p + 6p^2 + p^3$
$-2y = -4 - 2p$
$-5 = -5$

the sum $-1 + 10p + 6p^2 + p^3 = 0$;
hence $p = \frac{1}{10} = \cdot 1$ nearly.

Assume $p = \cdot 1 + q$;

then $p^3 = 0{\cdot}001 + 0{\cdot}03q + 0{\cdot}3q^2 + q^3$
$+ 6p^2 = 0{\cdot}06 + 1{\cdot}2 + 6$
$+ 10p = 1 + 10$
$- 1 = -1$

the sum $0{\cdot}061 + 11{\cdot}23q + 6{\cdot}3q^2 + q^3 = 0$.
hence $q = -0{\cdot}0054$ nearly.

Assume $q = -0{\cdot}0054 + r$;

then $q^3 = -0{\cdot}000000157464 + 0{\cdot}00008748r$, &c
$+6{\cdot}3q^2 = +0{\cdot}000183708 + 0{\cdot}06804r$, &c.
$+11{\cdot}23q = -0{\cdot}060642 + 11{\cdot}23r$
$+0{\cdot}061 = +0{\cdot}061$

the sum $+0{\cdot}000541550536 + 11{\cdot}16204748r$;
hence $r = -0{\cdot}000048517$, &c.

Hence, $y = 2 + p + q + r$
$= 2 + 0{\cdot}1 - 0{\cdot}0054 - 0{\cdot}000048517$
$= 2{\cdot}094551483$,

the root of the equation $y^3 - 2y = 5$. And the approximation of the roots of literal equations is performed by Sir Isaac Newton in the same manner.

Other methods of approximation to the roots of equations may be seen in Clairaut's Algebra, in Newton's, Simpson's, Bonnycastle's, and Frend's Algebra, and in Hutton's Course of Mathematics. Consult also J. Bernouilli, Operum tom. iii. Taylor, in Phil. Trans. an. 1717, Simpson's Essays, his select Exercises, and La Grange in Mem. Acad. Berlin, an. 1767: see also EQUATIONS.

APPROXIMATION, in medicine, a magnetical kind of cure, or method of transplanting a disease into some other subject, whether animate or vegetable, by bringing it in immediate contact with the patient.

APPUI, in the menage; q. d. rest or stay upon the hand; is the reciprocal effort between the horse's mouth and the bridle hand, or the sense of the action of the bridle on the hand of the horseman. A just appui of the hand is the nice bearing up or stay of the bridle, so that the horse, being awed by the sensibility and tenderness of his mouth, dares not rest too much upon the bit-mouth, nor check or beat upon the hand to withstand it. A horse is said to have no appui when he is too apprehensive of the hand and cannot bear the bit. He is said to have too much appui when he rests or throws himself too much upon the bit. Horses designed for the army ought to have a full appui upon the hand. To give a horse a good appui he should be galloped, and put often back.

APPULSE', } *Ad, pello, pulsum*, to beat or
APPUL'SION. } dash. A beating or dashing against.

An hectic fever is the innate heat kindled into a destructive fire, through the *appulse* of saline steams. *Harvey.*

In vowels, the passage of the mouth is open and free, without any *appulse* of an organ of speech to another; but, in all consonants, there is an *appulse* of the organs. *Holder.*

APPULSE, in astronomy, the approach of any planet to a conjunction with the sun, or a star. It is a step towards a transit, occultation, conjunction, eclipse, &c. M. Flamsteed, M. de la Hire, and others, have given observations of the moon's appulses to the Pleiades.

APPURTENANCES, or APPERTINANCES, in common law, things belonging to some other as their principal. Appurtenances may either be things corporeal, as hamlets belonging to a chief manor; or incorporeal, as liberties and services of tenants.

APREECE, AP RHYS, or RHESE (John), a native of Wales, an eminent antiquary born in the early part of the sixteenth century, and in 1534 graduated in civil law at Oxford. One of his principal works, entitled Fides Historiæ Britanniæ, is preserved in manuscript in the Cotton library. His other productions are: Historiæ Britanniæ Defensio, printed in 1573; A Description of Wales, in quarto, 1663; a treatise De Variis Antiquitatibus, and Defensio Regis Arthuri. He died in the reign of queen Mary.

APRI, the name of a kind of vermes found in the intestines and lungs of the boar.

APRICARIUS, in ornithology, a species of charadrius, about the size of the golden plover, found in the northern parts of Europe. It is the pluvialis aurea freti Hudsonis of Brisson; pluvier doré à gorge noire of Buffon; spotted plover of Edwards; and alwargrim plover, Arct. Zool. and Lath. Gen. Syn.

APRICOT, in botany. See PRUNUS.

APRICOT WATER. To a quart of water put six or eight apricots sliced, and the kernels bruised; boil the whole to extract the taste; and when cold add four or five ounces of sugar. When that is dissolved, strain it.

APRIES, or PHARAOH HOPHRA, the son of Psammis king of Egypt; prophesied against by Jeremiah and Ezekiel. He oppressed his subjects, ruined Sidon, and some say he put Jeremiah to death. He thought neither God nor man could dethrone him; which, however, was done by Amasis, and he himself was strangled. See AMASIS.

APRIL, in chronology, Aprilis, i. e. Aperilis, because the spring, *aperit*, opens or commences with this month. *Virg. Georg.* l. 1, v. 217.

Candidus auratis aperit cum cornubus annum
Taurus.

When, with his golden horns in full career,
The Bull beats down the barriers of the sea,
And Argo and the Dog forsake the northern sphere.
Dryden.

It was the second month of Romulus' year and the fourth of Numa's year, which began in January. Romulus consecrated this month to Venus, the mother of Æneas. Ovid. Fast. l. 1, v. 39. April is represented by a young man in green, with a garland of myrtle and hawthorn buds; in one hand primroses and violets, in the other the sign Taurus. It is the second month according to the computation of astronomers. It contains thirty days.

A PRIORI, a kind of demonstration. See DEMONSTRATION.

A'PRON, } Of unsettled etymology; per-
A'PRONED. } haps from the Fr. *naperon*, a large cloth. In the Celtic, *apparn* is found. A cloth hung before to keep the other dress clean.

Give us gold, good Timon: hast thou more?—
Hold up, you sluts,
Your *aprons* mountant. *Shakspeare.*
The nobility think scorn, to go in leather *aprons.* *Id.*

How might we see Falstaff, and not ourselves be seen?—Put on two leather jerkins and *aprons*; and wait upon him at his table as drawers. *Id.*

In these figures, the vest is gathered up before them, like an *apron*, which you must suppose filled with fruit. *Addison.*

APRON, in naval architecture, is a piece of curved timber fixed behind the lower part of the stern, immediately above the foremost end of the keel. Apron is also a name given to a platform or flooring of a plank, raised at the entrance of a dock, against which the dock gates are shut.

APROSIO (Angelico), a monk of Genoa, the author of several books, chiefly under fictitious names; but best known by a curious work entitled Bibliotheca Aprosiana, Bologna, 1673. He died in 1681.

APSINTHATUM, in physic, a kind of potion to strengthen the stomach. See ABSINTHITES.

APSIS; *αψις*, Gr. or *absis*, Lat.; the arched roof of a house, room, or oven, &c.; also the ring or compass of a wheel.

APSIS, in ecclesiastical history, the inner part in the ancient churches, wherein the clergy sat, and where the altar was placed. It is supposed to have been thus called because covered with an arch. The word is more particularly used for the bishop's throne, in ancient churches; called apsis gradata, because raised on steps above the ordinary seats. Apsis is also used for a reliquary, or case wherein the relics of saints were anciently kept, which was round or arched at the top, and commonly placed on the altar: it was usually of wood, sometimes also of gold and silver, with sculptures, &c.

APSIS, apsides plural, *αψις*, is applied, in astronomy, to two points in the orbits of planets, in which they are at the greatest and the least distance from the sun or earth. The higher apsis is more particularly denominated aphelion, or apogee; the lower, perihelion, or perigee.

APSYCHIA; from *α* privative, and *ψυχη*, soul; in medicine, a swooning or fainting away, called also lypopsychia and apopsychia.

APSYCTOS; from *α*, and *ψυχω*, to cool; a word used by the ancients as the name of a stone found in Arcadia, and of the color of iron, the quality of which they say was, that when once heated red hot it would never grow cold again. We have some stones indeed in England, that when once heated will retain a warmth a long time, but all the other accounts seem groundless; our warming stone used in Cornwall and Yorkshire to lay at the feet of people's beds, will retain warmth eight or ten hours; and there is a sort of red stone cut out of the salt mountains near Cordova, and formed into broad tiles called ruggiolos by the Italians, which, being once well heated, will retain a sensible warmth twenty-four hours; but these do not all come up to the qualities of this imaginary stone of the ancients.

APSYRTUS, in the materia medica of the ancients, a name given to the common marrubium, or horehound.

APT', *v.* & *adj.* } *Apto* (Gr. *απτω*), to make
AP'TITUDE, } things fit, to put in order.
APT'LY, } To join, fit, render suitable
APT'NESS, } or convenient. Hence to
AP'TISE. } possess the requisites for an office, or employment, or situation. To manifest readiness or dexterity.

PHILOST. A play, there is, my lord, some ten words long,
Which is as brief as I have known a play;
But by ten words, my lord, it is too long;
Which makes it tedious; for in all the play
There is not one word *apt*, one player fitted.
Shakspeare. Midsummer Night's Dream.

HAM. Haste me to know't, that I, with wings as swift
As meditation, or the thoughts of love,
May fly to my revenge.
GHOST. I find thee *apt*,
And duller should'st thou be than the fat weed
That roots itself in ease on Lethe's wharf,
Would'st thou not stir in this. *Id. Hamlet.*

Devotion, when it does not lie under the check of reason, is *apt* to degenerate into enthusiasm. *Addison.*

We should compose our minds into a frame of reverence and awful regard to the majesty of God, into a lowly, calm, and tender disposition of heart, *apt* to express all respect due to his presence, fit to admit the gracious illapses of his Holy Spirit; very susceptive of all holy and heavenly affections, which are suitable to such a communion or may spring from it. *Barrow.*

It has been said, that certain melodies and harmonies have an *aptitude* to raise certain passions, affections, and sentiments in the human soul. *Beattie.*

APT, a town in Upper Provence, situated on the river Calaron, and now the capital of an arrondissement in the department of the Vaucluse. In the time of the Romans it was a place of considerable note, and it still contains a number of Roman antiquities. Here are considerable manufactures of woollen cloth and wax candles; and a trade is carried on in wine and fruit, particularly plums. Population by the last returns 4621. The arrondissement comprises the eastern part of the department, and has about 48,800 inhabitants. Ten leagues north of Aix, and ten and a half east of Avignon. Long. 5° 28′ E., lat. 43° 50′ N.

APTA. See APT.

APTERA, a classical name; from *α* negative, and *πτερον*, a wing; used by Linnæus for the seventh order of insects, comprehending such as have no wings. It consists of fourteen genera and 297 species. Hill divides this order into two classes: viz. 1. A. anarthra, insects which have neither wings nor limbs; and 2. A. podaria, insects which have limbs but no wings.

APTERA, in entomology, the specific name of an insect of the ptinus genus.

APTERA, or APTERON, a town of Crete, on the west side of the island, twelve miles south of Sidon, and as many from the Sinus Amphimales. According to Stephanus, it was so called from the Sirens, who, being there vanquished by the

Muses in singing, stripped themselves of their wings and leaped into the sea.

APTERUS, in entomology, a species of hister found in Italy. Also a species of curculio, the curculio cruciatus of Degeer, found at the Cape of Good Hope. Also a species of cimex, found in Europe by Fabricius.

APUA, in ichthyology, the name of a small sea-fish, supposed by many to be produced by the slime and mud of the shores. There are two species of this fish: viz. 1. A. phalerica; and 2. A. vera.

Apua Membras, in ichthyology, a name by which some have called the pilchard.

APULEIUS (Lucius), a Platonic philosopher, universally known by his celebrated work entitled the Golden Ass. He lived in the second century under the Antonines, and was born at Madaura, a Roman colony in Africa. He studied first at Carthage, then at Athens, and afterwards at Rome, where he learned the Latin tongue without the help of a master. He was a man of an inquisitive disposition, especially in religious matters: this prompted him to take several journeys, and to enter into several different societies of religion. He spent his whole fortune almost in travelling; so that at his return to Rome, when he was about to dedicate himself to the service of Osiris, he had not money enough to defray the expense attending the ceremonies of the reception, and was obliged to pawn his clothes to raise the necessary sum. He supported himself afterwards by pleading causes; and as he was a great master of eloquence, and of a subtle genius, many considerable causes were entrusted to him. He married a widow named Pudentilla, who was very rich. This marriage brought upon him a troublesome law-suit. The lady's relations, pretending he made use of sorcery to gain her heart and money, accused him of being a magician before Claudius Maximus, proconsul of Africa. Apuleius was under no great difficulty of making his defence. 'Do you make a wonder (said Apuleius in his defence) that a woman should marry again, after having lived a widow thirteen years? it is much more wonderful that she did not marry again sooner. You think that magic must have been employed to prevail with a widow of her age to marry a young man; on the contrary, this very circumstance shows how little occasion there was for magic.' The Apology is still extant, and is reckoned a very fine piece. Apuleius was indefatigable in his studies; and composed several books in verse and prose; but most of them are lost. He took great pleasure in declaiming, and was heard generally with great applause. When he declaimed at Oeca, the audience cried out with one voice, that they ought to confer upon him the honor of citizen. The citizens of Carthage heard him with great satisfaction, and erected a statue to him; and several other cities did him the same honor. Several critics have published notes on Apuleius's Golden Ass, and there have been translations of it into different languages. This humorous production was by many believed to be a true history; and among the rest St. Augustine entertained his doubts, while bishop Warburton deems it a work written in opposition to Christianity, and with a view to recommend the Pagan religion 'as a cure for all vices.' The same learned author also explains the beautiful allegory of Cupid and Psyche, which makes a long episode in the Golden Ass, upon the same principles. Dr. Lardner was of a different opinion, and probably Bayle comes nearest the truth, who regards this eccentric production as a mere satire on the frauds of the dealers in magical delusion, and on the tricks of priests, and other crimes, both of a violent and deceptive character, which are so frequently practised with impunity.

APULIA, now called Puglia, a territory of Italy, bordering on the Adriatic, and extending from the river Frento to Tarentum in length, and from the Adriatic to the Lucani in breadth. It was divided into Apulia Daunia, now called Puglia Pinna, or the Capitanata; and Apulia Peucetia, now Terra di Barri. Apulia abounded in sheep, which yielded the finest wool.

APULUS, in entomology, a species of sphinx, a native of Surinam.

APURE, a large river of South America, in New Granada, which has its rise in one of the ridges that diverge from the eastern chain of the Andes, and penetrate the Caraccas in a north-east direction to the Atlantic Ocean. The mountains in which it has its source are in the neighbourhood of St. Christopher, a dependency of the province of Santa Fé. The length of this river is 170 leagues, of which forty are from north-east to south-east, and the remainder from west to east. It then takes its course to the south, to join the Orinoco; and in its course the volume of its waters is increased by a number of other rivers, of which some are navigable, and the more useful, because, after having irrigated a greater part of Venezuela, they serve for the conveyance of the produce which springs from the luxuriance thus afforded to the soil. These rivers are the Tinaco, San Carlos, Cojeda, Aguablanca, Acarigua, Areyaruo, Hospiria, Abaria, Portuguesa, Guanure, Tucupido, Bocono, Masparro, La Yuca, St. Domingo, Tisnados, &c. These successively confound their waters in the immense plains of Venezuela. Almost the whole of them are united above Santiago, and form a considerable volume of water, which, at twelve leagues below that place, throws itself into the Apure, at the distance of twenty leagues to the north of the Orinoco. This quantity of water, being too much for the bed of the Apure to contain, is forced into a division of many branches, and so falls by several mouths into the Orinoco. Its rush is so violent that the Orinoco, although it be a league in width, resigns its current entirely to the influence of the waters of the Apure for upwards of a league. The shock of the two streams is so violent, that it occasions a great agitation in the middle of the river; and such dreadful eddies and whirlpools are formed, that even the crafty and dexterous Indian has been known to shudder at them. The Apure runs for the space of three leagues more, amicably with the Orinoco, though its waters are still distinguishable from their bright and crystal appearance, until they become at length confounded with the dark stream of the Orinoco. Upon the banks of

the Apure, and its tributary streams, there are numerous commons, the animals of which are very much esteemed. They are composed of beeves, horses, and mules, but principally of the last. Their exportation is naturally by Guiana, on account of the advantage afforded by the pastures in that route to the very mouth of the Orinoco. All that portion of Venezuela which at the present day forms the new province of Varinas, and all the southern part of the province of Venezuela itself, are induced, by the easy means of conveyance afforded by the river, to send their coffee, cotton, and indigo to Guiana, instead of carrying them on the backs of mules to Caraccas, or to Porto Cabello, and travelling 100 leagues in a country almost impassable, and inundated by rivers that continually overflow their banks. See *Humboldt's Personal Narrative*, vol. iii.

APURIMA, or APURAMAC, a rapid river of Peru, in South America. It rises in the province of Abancay, in Peru; and afterwards pursues a northerly course, passing through Cuzco: after running 120 leagues through the mountains of the Andes, it enters the Amazons under the name of the Ucayale, in such an augmented stream that it is not easy to say which is the tributary one. It traverses the high road which leads from Lima to Cuzco, and is passed by a bridge made of thong or cords of 60 yards long and three wide, at which there is paid a toll for all goods passing.

APURWACA, a river of Guiana, in South America, which is one of the most considerable in the country.

APUS, Avis Indica, in astronomy, a constellation of the southern hemisphere, placed near the pole, between the triangulum australe and the chameleon, and supposed to represent the bird of paradise. The number of stars contained in this constellation is eleven in the British catalogue; in Bayer's maps 12; but more numerous in La Caille's catalogue: the largest is only of the fifth magnitude.

APUS, in ornithology, a species of hirundo, commonly known by the name of swift or black martin. This is hirundo apus of Aldrovandus; martinet noir, and grand martinet of Buffon. They inhabit the whole of the European continent, and have also been noticed at the Cape of Good Hope, and Carolina in North America.

APUS, in entomology, a species of monoculus. It is the binoculus cauda biseta of Geoffroy; binoculus (palustris) oculis superis, testa subtus truncata, cauda biseta of Mull. Zool. Dan.; limulus palustris, Mull. Entom.; and monoculus cancriformis, Scæf.

APUTTASY, in botany, a name given by the people of Guinea to a tree, a decoction of which is greatly used among them for washing the mouth to cure the scurvy in the gums, and preserve the teeth.

APYCNI, in ancient music, was used for those chords or sounds of the scale as could not enter the spissum. They were stabiles, fixed. Apycni suoni, in music, sounds distant one or more octaves, and yet concord.

APYCNOS, in music, is said of the diatonic genus, on account of its having spacious intervals, in comparison of the chromatic and enharmonic.

APYRENOS properly signifies without kernels. The Greek writers, however, did not always keep strictly to this sense of the word, but sometimes applied it to such fruits as had fewer and softer kernels than others of the same kind.

APYREXY, in medicine; from the privative *a*, and *πυρ*, heat; the intermission of a fever, or ague.

APYROI, in antiquity, a denomination given to altars whereon sacrifice was offered without fire.

APYROMETALLUM, in metallurgy, a name by which some authors have called gold, from its resisting the force of fire.

APYRON, something that has not undergone the fire. In this sense, sulphur vivum, or native sulphur, is particularly denominated apyron.—Some authors also give the denomination apyron to a modern process for making æthiops mineral, without fire, by trituration alone.

APYROUS, a word applied to denote that property of some bodies, by which they resist the most violent fire without any sensible alteration. Apyrous bodies ought to be distinguished from those which are refractory. Refractory substances are those which cannot be fused by violent heat, whatever other alteration they may sustain. But a body, properly speaking, apyrous, can neither be fused by heat, nor can undergo any other change. Diamonds were long thought to be possessed of this property. But some late experiments have shown, that diamonds may be entirely dissipated or evaporated by heat, and are therefore not entitled to be ranked among apyrous substances. Perhaps there is no body in nature essentially and perfectly apyrous. But it is sufficient that there be bodies apyrous relatively to the degree of fire which art can produce, to entitle them to that name.

AQUA. Latin. A word signifying water, very much used in chemical writings.

AQUA is by some supposed to be compounded of *a* and *quâ*, i. e. from which; alluding to the opinion that water is the basis of all bodies. The word frequently makes part of the name of medicines and other menstruums, which, though in a liquid form, possess powers and qualities very different from those of water.

AQUA CHRYSULCA, a subtle kind of aqua regia, called also aqua pugilum. Three parts of sal ammoniac, and two of nitre, injected into a tubulated retort made red hot, yield this acid compound spirit.

AQUÆ BAJALUS, an ancient name for the clerk officiating under the chief minister, whose business was to assist him in carrying the holy water. The office corresponding to it at present is that of the parish clerk.

AQUÆ CALIDÆ, the ancient name of the city of Bath, mentioned by Ptolemy as belonging to the ancient Belgæ, and famous for its hot waters. See BATH.

AQUÆ CALIDÆ, a Roman colony between the rivers Serbetes and Savus in Mauritania Cæsariensis.

Aquæ Celeniæ, Aqua Cilinæ, an ancient village in Gallicia, seated on the Minho, mentioned by Ptolemy and Antonine as famous for its mineral waters. It is now named Caldas.

Aquæ Cutiliæ, a lake of the Sabines, in the territory of Reate, said by Seneca and Pliny to have had a floating island on it. Varro calls it Lacus Cutiliensis, and supposed it to be the centre of Italy. The waters were medicinal, and extremely cold, good for a weak stomach and in weak nerves; they seemed to act by a kind of suction which approached to a bite. Vespasian used them every summer; and died there. It is now called Lago di Contigliano.

AQUÆDUCT. See Aqueduct.

Aquæ Flaviæ, a town on the confines of Gallicia and Portugal, so called from the Vespasians. It is now called Chiaves, and is a mean hamlet: but the ruins of its bridge testify of its former grandeur.

Aquæ Granii, the ancient name of Aix-la-Chapelle.

Aquæ Haustus, in the civil war, a right of drawing water and carrying it through another's ground.

Aquæ Helvetiæ, a place described by Tacitus as a municipal town, and much frequented for its excellent water; and though he does not mention its name, Cluverius supposes it to be Baden in Switzerland, on the rivulet Limat, which soon after falls into the Aar. It is called the Upper, to distinguish it from another called the Lower Baden, in Alsace.

AQUÆMANILIS; from aqua, water, and manus, hand; is used, in ecclesiastical writers, for a laver, anciently placed in the vestibules of churches to wash the hands in.

Aquæ Merom, a place famous for the defeat of Jabin: supposed to be the lake called Samachonitis, or Semechonitis, by Josephus; into which the river Jordan falls, before it comes to the sea of Galilee.

Aquæ Pannoniæ, the ancient name for Baden.

Aquæ Patavinæ, baths in the territory of Venice, near Padua, called Fontes Aponi, by Livy and Martial; now bagni d'Abano.

Aquæ Pavor is used by some for the hydrophobia.

Aquæ Quintianæ, a place put by Ptolemy, in room of the Aquæ Cilinæ of Antonine; and now supposed to be Sarria, a town of Gallicia, on a rivulet of the same name, three leagues south of Lugo.

Aquæ Sextiæ. See Civitas Aquensis.

Aquæ Statiellæ, or Aquæ Statiellorum, a town in Liguria, on the river Bormia; now called Acqui, which see.

Aquæ Tauri, an ancient town in Tuscany, famous for its baths, at the distance of three miles from the sea, said to have been discovered by a bull, whence the appellation. The ruins of these baths are still to be seen. The town is now called Acquapendente, which see.

Aqua Extincta, extinguished water, is aqua fortis into which water has been poured, in order to qualify it, and render it less corrosive. It is used to separate the silver from the aqua fortis which had been employed in parting the gold from it.

Aqua Fortis, a corrosive liquor, made by distilling putrified nitre with calcined vitriol, or rectified oil of vitriol, in a strong heat; the liquor, which rises in fumes red as blood, being collected, is the spirit of nitre or aqua fortis; which serves as a menstruum for dissolving silver, and all other metals except gold. It is divided into double and single, the single being only half as strong as the other. Artists who are in the habit of using these two sorts of acids, call them generally aqua fortis; and only the more concentrated acid, which is much stronger than even the double aqua fortis spirit of nitre. The aqua fortis used by dyers, brass-founders, &c., is not only weaker than spirit of nitre, but contains a portion of vitriolic acid. It may be made by distilling crude nitre with calcined vitriol, equal parts. The nitrous acid expelled by the vitriolic, will rise in red fume, and pass into the receiver. The vitriolic acid, uniting with the alkaline basis of the nitre, forms vitriolated tartar; but, there being more vitriolic acid than is requisite to saturate the alkali, the surplus rises with the nitrous acid; aqua fortis, therefore, is a mixture of these two acids. It may also be made by distilling crude nitre, with somewhat more than half its weight of oil of vitriol; or by mixing one part of oil of vitriol, with nine parts of pure spirit of nitre.

AQUALICULUS, in anatomy, a name given by some to the region of the body wherein the trunk terminates, and the thighs commence.

Aqua Marina, of the Italian lapidaries, is of a sea or bluish green. This stone seems to me to be the beryllus of Pliny. It ranks but low in value among precious stones, but was often used by gem sculptors.

AQUAMBOE, one of the greatest kingdoms on the coast of Guinea in Africa, stretching twenty miles in breadth, and ten times that space in length, from east to west. According to Bosman, the coast is divided into a great number of petty royalties, but all of them subject to the king of Aquamboe, who indiscriminately uses an unlimited authority over them, and the meanest of his subjects. His despotism gave rise to a proverbial saying, that 'that there are only two ranks of men at Aquamboe, the royal family and slaves.' The natives of this country are haughty, turbulent, and warlike; and their power is formidable to all the neighbouring nations. They grievously infest such nations as are tributaries to the king of Aquamboe, entering their territories by troops, and carrying off from the inhabitants whatever they think proper; nor do they ever meet with any opposition from the inhabitants, as they are sensible the king would not fail to resent this as an indignity offered to him.

Aqua Mercurialis, a preparation of aqua regia and sublimate of mercury, with a little mercury, placed in a sand heat, till the solution of the mercury be made. It is a mark of perfection of the aqua mercurialis, if it turn a piece of copper cast into it, of a silver color. It is by this water that the alchemists pretend all metalline bodies may be reduced to their first matter or mercury.

Aqua Mirabilis, the wonderful water, prepared of cloves, galangals, cubebs, mace, ca-

damums, nutmegs, ginger, and spirit of wine, digested twenty-four hours, then distilled.

Aqua Naphæ, is a name given to the distilled water of orange-flowers.

AQUAPOISE; from aqua, and poids, Fr. weight; an instrument for examining the weight of liquors.

Aqua Regia, or Aqua Regalis, an acid water, so called because it dissolves gold, the king of metals. Its essential ingredient is common sea-salt, the only salt which will operate on gold. It is prepared by mixing common sea-salt, or sal ammoniac, or the spirit of them with spirit of nitre, or common aqua fortis. It is composed of nitrous and marine acid, in different proportions according to the purpose for which it is intended. When made with sal ammoniac, the common proportion is one part of this salt to four parts of nitrous acid; but to dissolve platina, equal parts are requisite. A purer aqua regia may be made by simply mixing the two acids. Aqua regia likewise dissolves all other metals, except silver. The gold dissolved in aqua regia is, in fact, dissolved in the dephlogisticated marine acid only, which, being deprived of its phlogiston by the nitrous acid, recovers it from the gold, and thus renders gold soluble; for metals are not soluble in acids until they lose a part of their phlogiston. See Chemistry, Index.

AQUARIANS, 1. Christians in the primitive church who consecrated water in the eucharist instead of wine. This they did under pretence of abstinence, or, because they thought it universally unlawful to eat flesh or drink wine. Epiphanius calls them Encratites, from their abstinence; St. Austin, Aquarians, from their use of water; and Theodoret, who says they sprang from Tatian, Hydroporostatæ, because they offered water instead of wine. 2. There was another sort of Aquarians, who did not reject the use of wine as unlawful; for they administered the eucharist in wine at evening service; but, in their morning assemblies, they used water for fear the smell of wine should discover them to the heathens.

AQUARIUS, the water-carrier, in astronomy, the eleventh sign in the zodiac, reckoning from Aries; from which also the eleventh part of the ecliptic takes its name. The sun moves through Aquarius in the month of January; it is marked thus, ♒ by astronomers. The poets feign that Aquarius was Ganymede, whom Jupiter ravished under the shape of an eagle, and carried away into heaven, to serve as a cup-bearer in the room of Hebe and Vulcan; whence the name. Others hold that the sign was thus called, because, when it appears in the horizon, the weather usually proves rainy. The stars in this constellation, in Ptolemy's catalogue, are forty-five; in Tycho's forty-one; in Hevelius's forty-seven; in Flamsteed's 108.

AQUARTIA, in botany, a genus of the tetandria monogynia class. The calyx is campanulated; the corolla is rotated, with linear divisions; and the berry is four-seeded. There is but one species; viz. A. aculeata, a native of America and the West Indies.

Aqua Secunda, aqua fortis much diluted with pure water. It is employed in several arts to clean the surface of metals and certain stones, and for various other purposes.

Aqua Sicca Philosophorum, a cant term, invented by some alchemists for the flowers of zinc, called by several other as unmeaning names by these writers; as sericum, philosophic cotton, and talc. A preparation of these flowers by means of vinegar, has also been called oil of talc, and many great properties assigned to it; but it is truly no other than the oil of the grape, from which the vinegar was made, and has no title to any thing that has been said of it.

Aqua Sulphurata, sulphur water, a new name for what was originally called gas sulphuris by Van Helmont. See Gas.

AQUATIA, in writers of the middle age, a right of fishing three days in the year. In ancient deeds we find divers grants of this privilege of aquatia, aquatura, or aquaria. In some writings, aquatia also signified a fee, or service, paid for the privilege of fishing.

AQUAT'ICK, Aquat'ical, Aq'uatile, Aq'ueous. } Lat. *aqua*, water. Applied to that which grows or delights in water. Aqueous, watery.

We behold many millions of the *aquatile* or water frog, in ditches and standing plashes.

Brown's Vulgar Errors.

The vehement fire requisite to its fusion, forced away all the *aqueous* and fugitive moisture.

Ray on the Creation.

Brutes may be considered as either aerial, terrestrial, *aquatic*, or amphibious. *Aquatic* are those whose constant abode is upon the water. *Locke.*

Aquatiles Dii, in the mythology, aquatic gods; such as Neptune, Amphitrite, the Tritons Naiads, &c.

AQUATINTA, a method of etching on copper, by which a soft and beautiful effect is produced, resembling a fine drawing in Indian ink; one of the many valuable improvements which were made in the fine arts, towards the end of the eighteenth century. Previous to the operation on the plate, the following powder must be prepared: Take equal parts of asphaltum and fine transparent resin, and powder them separately in a mortar. Sift through a muslin sieve, upon a sheet of paper, a thin stratum of the asphaltum, above which sift a similar layer of the resin, and upon this another layer of the asphaltum, continuing these alternate layers till both of the powders are exhausted. Then pass the mixture both together through the same sieve so as to mix them sufficiently for use. Some, instead of the above mixture, use powdered gum sandarach only. A copper-plate being polished in the usual way, lay the etching ground upon it, and etch the outlines of the design in the manner directed under the article Etching. Then soften the ground with grease, and wipe it off with a rag, leaving as much grease upon the plate as just to dim the copper. Next sift the powder upon the surface of the plate; after which, strike the other side of it pretty smartly against the edge of a table to discharge it of the loose powder. Then hold the back of the plate with a hand-vice over a chafing-dish of burning charcoal, till it become so hot as to give pain

upon being touched with the back of the hand; and the powder which adhered to the grease will now be fixed to the plate. The plate being then suffered to cool, take turpentine varnish mixed with ivory-black; and, with a hair pencil dipped in it, cover all the lights or places where there is no work or shade. A border of bees' wax is now to be raised round the plate; and having diluted a quantity of aqua fortis to a proper weakness with water, pour it on, and let it stand five minutes for the first or lightest shade; after which, pour it off; and having washed the plate with water, set it edgeways to dry. Then with varnish stop out all the light shades, pour on the aqua fortis for the second tint, and let it stand five minutes more; proceeding in the same manner for every tint till you produce the darkest shades. If a bold open ground is wanted in any part, this requires an after operation. The ground must be laid as in the other case, by sifting on the powder; only this powder must be much coarser, and the plate more heated, that the particles of the powder may spread, and form small circles; good clean resin will do by itself. In etching landscapes, the sky and distant objects are also performed by a second operation, and the powder is sifted upon the plate with a finer sieve. If the trees or any part of the fore-ground require to be finished higher, the plate must be entirely cleansed from grease with bread, and a ground laid in the common way of etching. We next proceed to describe the second method of producing the aquatint ground, which is generally adopted. Some resinous substance is dissolved in spirits of wine, as, for instance, common resin, Burgundy pitch, or mastic, and this solution is poured all over the plate, which is then held in a slanting direction till all the superfluous fluid drains off, and it is then laid down to dry, which it does in a few minutes. If the plate be then examined with the magnifier, it will be found, that the spirit in evaporating has left the resin in a granulated state; or rather, that the latter has cracked in every possible direction, still adhering firmly to the copper. A grain is thus produced with the greatest ease, which is extremely regular and beautiful, and much superior for most purposes to that produced by the other method. After the grain is formed, every part of the process is conducted in the same manner as above described. This is the method practised in France. A landscape, or any similar subject, may be printed off at once in its different proper colors, by laying these upon the plate. In this case, the colors must be pretty thick in their consistence; and the plate must be carefully wiped in the usual way after laying on each tint, as well as receive a general wipe when charged with all the tints. The art of engraving in aquatinta is kept a secret by those artists who practise it. In order to succeed in it, great care and judgment are requisite; and much depends upon a certain nicety of management which is only attainable by practice.

AQUA TOFANA, called also Aqua della Toffanina, or aqua della tofa, from its supposed inventress; aqua del petesino; aquetta di Napoli, or simple aquetta. A poisonous liquor used to a very great extent at Naples and Rome during the latter half of the seventeenth century. More people, according to Gmelin, were destroyed by it than by the plague, which had prevailed a short time before; and Tofania is said to have confessed she had used it to poison more than 600 persons. The aqua tofana is described as being as limpid as rock water, and perfectly tasteless, so that it could be administered without exciting the least suspicion.

The abbé Gagliani and Archenholz more recently state it to have been a preparation of cantharides and opium; but this is perfectly inconsistent both with its appearance and effects. By no preparation can the smell and taste of opium, in sufficient quantity to produce any effect, be concealed; and the acrimony of cantharides is equally connected with its activity. The one of these drugs is highly stimulant, the other sedative, and neither of them capable of remaining latent in the system. Erndtel has conjectured that the chief ingredient was lead. Halle, (Die deutchen giftpflanzen, Berlin, 1783) believes that it was prepared from the frothy saliva gathered round the mouth of a person tortured to death. Garelli, on the contrary, positively asserts it to have been nothing but a solution of crystallised arsenic in a large quantity of water, with the addition, for some unknown reason, of a very innocent herb, the antirrhinum cymbalaria. The same account is given by Bertholinus, and the most judicious writers on the subject.

It is one, however, of considerable obscurity; and it was generally believed that the effect of taking it was certain death; and that it could be so tempered or managed as to prove fatal in any determinate time, from a few days to a year and upwards. Four or six drops were reckoned a sufficient dose, and were said to produce no violent symptoms, or vomiting, and but very seldom pains, inflammation, or fever; but only a feeling of indisposition, without any definite symptoms, except sometimes inextinguishable thirst; the victim sunk into a languid state, became disgusted at all kinds of food, and weariness of life succeeded; the nobler organs then gave way, the lungs were wasted by suppuration, and death closed the miserable scene.

The original retailer of this poison was a Sicilian by birth, and first resided at Palermo. When or where she began to exercise her horrible profession, is not known; but it will appear, that it must have been at a very early age, and before 1659. She was extremely liberal of her preparation, chiefly it is said, to ladies tired of their husbands; and, the better to conceal the nature of her gift, it was put up in small flat phials, inscribed Manna of St. Nicholas of Bari; being ornamented on one side with an image of the saint, that it might pass for a liquid said to drop from his tomb at Bari. The viceroy of Naples, then Count Daun, only made the discovery of her detestable practice in 1709. She was now extremely cautious, and often changed her abode or retired into convents. At last she was betrayed, and, although in a convent, seized, and carried to the Castel del Uovo. On this, cardinal Pignatelli, then archbishop of Naples, indignant at the violation of a religious sanctuary,

threatened to excommunicate the city, if she was not delivered up to him. But the viceroy caused a report to be spread, that she and her accomplices had determined upon the same day to poison all the springs in the neighbourhood, the grain and fruits brought to market, &c. When the credulous populace became clamorous for her punishment, a kind of compromise was entered into with the cardinal; in consequence of which after being strangled, her body was conveyed at night into the court of the convent. Garelli, however, says she was alive in prison at Naples, when he wrote to Hoffmann, not long before 1718; and Keysler, who visited Naples in 1730, asserts that she was then living in prison, and few strangers left the city without going to see her.

It is said that the Roman ladies extensively availed themselves of Tofania's discovery, and that a society of young married women, having for their president an old woman of the name of Hieronyma Spara, was detected and brought to punishment. Spara, who was a Sicilian, had acquired her knowledge from Tofania at Palermo, and was hanged with her assistant Gratiana. This poison was, it is said, exported from Italy to Paris at the close of the century; and Godin de Sainte Croix, living in a scandalous intimacy with the Marchioness Brinvillier, furnished her with it as a means of poisoning her father and her two brothers, besides others on whom she tried the effect of her preparations. One of these afterwards was called from her by the name Eau de Brinvilliers. She is also said to have employed a powder called Poudre de Succession. De Croix was suffocated accidentally, we are told, by the fumes of his own poisons; and the Marchioness was executed for her share in these transactions. At this period, the practice of secret poisoning became so extensive in Paris, that a court called the Chambre des Poisons, and Chambre Adente, was established to check it. See Poison.

AQUATUM, in physical writers, medicine diluted with water.

Aquatum Ovorum is used by some naturalists for what is otherwise called grando, but more usually chalaza.

Aqua Vitæ, Latin. It is commonly understood of what is otherwise called brandy, or spirit of wine, either simple or prepared with aromatics. But some appropriate the term brandy to what is procured from wine, or the grape; aqua vitæ, to that drawn after the same manner from malt.

Aqua Vitriolica Cerulea, a form of medicine in the London Pharmacopœia, made in the following manner: Take blue vitriol three ounces, alum and strong spirit of oil of vitriol of each three ounces, water a pint and a half; boil the salts in water till they are dissolved, and then add the oil of vitriol, and finally strain the whole through paper.

AQUAVIVA (Octavio), cardinal and archbishop of Naples, was descended of an illustrious family of that kingdom, and distinguished himself by his love of letters and learned men. He entertained several of them in his service, and had a particular friendship for the learned Peiresc. Pope Clement VIII. gave him the legation of Avignon, where he governed with great moderation and wisdom.

Aquaviva (Claude), the son of the duke of Atri, was born in 1542. He entered into the society of the Jesuits, of which he became general in 1581. He was the author of some pieces relating to his order and religion, the best of which is one on the cure of mental diseases. He died about 1607.

AQUEDUCT; from the Lat. *aqua*, and *duco*, *ductum*, to lead. A contrivance for the conveyance of water.

Into this lonely vale our steps we bend,
I and my sullen discontented friend;
The marble caves and aqueducts we view,
But how adult'rate now and diff'rent from the true.
Dryden's Juvenal.

Hither the rills of water are convey'd
In curious *aqueducts*; by nature laid,
To carry all the humour. *Blackmore.*

Aqueduct, in anatomy, a bony canal, or passage, in the os petrosum, supposed to contribute to the purposes of hearing. It is called aqueduct not only on account of its form, but, as some also imagine, from its serving to discharge any foreign matters collected in the inner cavities of the ear. It is sometimes also called aqueductus Fallopii, from Fallopius its first discoverer. See Anatomy.

Aqueduct, aqueductus, Latin. A conveyance made for carrying water from one place to another; made on uneven ground, to preserve the level of the water, and convey it by a canal. Some aqueducts are under ground, and others above it, supported by arches.

Architects have distinguished aqueducts into the visible and the subterraneous, formed by piercing mountains and elevated grounds. They were built of stone, hewn, or rough; and covered above with vaults, or flat stones; and divided sometimes into double and triple aqueducts; that is to say, such as were supported by two or three ranges of arcades. Such was the aqueduct which Procopius records to have been built by Cosroës king of the Persians, for the city of Petra in Mingrelia. Aqueducts of every kind were long ago the wonders of Rome; the vast numbers of them which they erected, the prodigious expense employed in conducting water by them from one place to another, sometimes to the distance of thirty, forty, and even 100 miles, may well excite our admiration. Appius Claudius the censor advised and constructed the first aqueduct. His example was soon followed; and the force of prodigious and indefatigable labor diverted the course of rivers and floods to Rome. Agrippa, in the year when he was ædile, completed the magnificence of these works. The aqueduct of the aqua Martia had an arch of sixteen feet in diameter. It was composed of three different kinds of stone. Above, there appeared two canals; of which the highest was fed by the new waters of the Tiverone, and the lower by what they called the Claudian river. The entire edifice was seventy Roman feet high. Near this aqueduct, Father Montfaucon gives the plan of another with three canals; the highest supplied by the Aqua Julia, that in the middle

from Tepula, and the lowest from the aqua Martia. The arch of the aqueduct of the aqua Claudia of hewn stone was very beautiful; the aqueduct of the aqua Neronia was of brick; each of them being seventy-two Roman feet in height. The consul Frontinus, who superintended the aqueducts under the emperor Nerva, mentions nine of them which had each 13,594 pipes of an inch in diameter; and Vigerus observes, that, in the space of twenty-four hours, Rome received by means of these erections 500,000 hogsheads of water. The general declivity of the aqueduct, according to Pliny, was one inch; and according to Vitruvius half a foot in a hundred. The principal Roman aqueducts now remaining are the aqua Virginia, repaired by Pope Paul IV. and the aqua Felici, constructed by Pope Sextus V. See ROME.

In modern times that of Segovia may be compared with the most admired labors of antiquity. At a recent period there remained 159 arcades, wholly consisting of enormous stones joined without mortar. These with the remains of the edifice were 102 feet high, in two ranges one above another. Louis XIV. caused an aqueduct to be begun in 1684, near Maintenon, for carrying water from the river Eure to Versailles; but the works were abandoned in 1688. This would have been, perhaps, the largest aqueduct in the world; the whole length being 60,000 toises; the bridge being 2070 fathoms in length, 220 feet in height, and consisting of 632 arches.

AQUEFORT, a small settlement of Newfoundland, on the east side of the southern extremity of the island. N. lat. 47° 5′, E. long. 52° 33′.

AQUENSIS CIVITAS, AQUÆ AUGUSTI, or AQUÆ TARBELLICÆ, a town of ancient Gaul, celebrated for its baths. It was situated on the Adour, in the ci-devant province of Gascony, which now forms a part of the department of Gers. It is now called Acqs, which see.

AQUETTA. See AQUA TOFANA.

AQUICALDENSIS, or AQUÆ CALIDÆ, the ancient name of a town of Gallicia; formerly in great repute for its public baths. Its ruins still retain marks of its ancient Roman grandeur. It is now called Orense, and lies on the Minho, fifty-four miles S. E. of Compostella.

AQUIGNY; a town and barony of France, in Normandy, situated near the conflux of the Eure and Iton, in the department of the Eure, arrondissement of Louviers, from which it is distant three miles. Population 1500.

AQUILA, a Jew, born in Pontus. He, with his wife Priscilla, had, for their business, to make leathern tents for the Roman troops. After they had resided some time at Rome, the edict of Claudius, banishing all Jews from that city, obliged them to leave it, and return to Corinth; where Paul lodged with him, and wrought at their business, till, probably to please the Gentiles, he went and lodged with Justus. They attended Paul to Ephesus, where they exposed their lives to protect him; and instructed Apollos in the way of the Lord more perfectly. They returned back to Rome; where a meeting of the Christians was held in their house and where they were saluted by Paul, in his epistle to that church. They returned to Asia, and dwelt in or near Ephesus; and were there when Paul wrote his second epistle to Timothy. Acts xviii. Rom. xvi. 4, 5. 2 Tim. iv. 19.

AQUILA, in astronomy, the eagle, a constellation of the northern hemisphere; usually joined with Antinous. The stars in the constellation Aquila and Antinous, in Ptolemy's catalogue, are fifteen; in Tycho's nineteen; in Hevelius's forty-two; in the Britannic catalogue seventy-one.

AQUILA, in chemistry, has several significations according to the epithets joined with it: such as, Aquila alba, a combination of muriatic acid with mercury, called mercurius dulcis, calomel, &c. Aquila philosophorum, a term used by alchemists to signify the reducing of metals to their primitive matter, &c.

AQUILA, in geography, a fine large city of Italy, anciently called Avia or Avella, and the capital of Abruzzo, seated on a hill on the banks of the river Alterno, or Pescara, near its source. It has an ancient castle, and is a bishop's see immediately under the pope. The land adjacent produces plenty of saffron. It was almost destroyed by an earthquake in February, 1703. The first shock was so terrible that the inhabitants abandoned the city; but returning to vespers, it being Candlemas day, the shocks followed one another with such violence, that 24,000 people perished, and great numbers were wounded; 800 were killed in one single church: many other churches, monasteries, noble buildings, and the town house, were either swallowed up or overturned, together with the greater part of the city and its walls. It is situated thirty-five miles west from the Adriatic, ninety-three north of Naples, and about sixteen from the confines of the Pope's dominions. Aquila was formerly an important barrier fortress; but the works are all demolished, with the exception of a small fort. The French troops forced their way through the gates of the town on the 16th of December, 1798; and on the following day the garrison of the fort surrendered as prisoners of war.

AQUILA, in ornithology, a synonyme for eagle. See FALCO.

AQUILÆ ARBOR, in botany, a name given by some authors to the tree whose wood is the agallochum, or lignum aloes of the shops.

AQUILANUS (Sebastianus), an Italian physician, was born at Aquila, in the kingdom of Naples. He practised with considerable reputation at Padua, and died there in 1543. He wrote several pieces on physical subjects, and was a zealous defender of Galen.

AQUILARIA, in botany, from Aquila, an eagle, a large tree affecting a lofty situation. Class, decandria; order, monogynia. General character: CAL. perianth. one-leafed, permanent: COR. none; nectary one-leafed, pitcher-shaped, of the length of the tube of the calyx STAM. filaments ten, alternating with the clefts of the nectary; antheræ oblong, versatile: PIST. germ. ovate: STYLE none: STIGM. simple: PER. capsule on a very short pedicle: SEEDS solitary, oblong. Essential general character: CAL. five-cleft: COR. none; nect. pitcher-shaped: SEEDS

solitary. Species 1. A. ovata. This is a large tree covered with grayish bark. Its leaves are entire, smooth, veined, about eight inches long, and stand on short hairy footstalks. The flowers terminate the branches, on many-flowered peduncles. A native of the mountains of Malacca and Cochin China. The wood of this tree has been long used as a perfume; and was formerly an article of the materia medica, under the name of agallochum, lignum aloes, or aloes wood.

AQUILEGIA, Columbine, a genus of the pentagynia order, and polyandria class of plants; natural order sixteenth, multisiliquæ: cal. none; petals five, with a horn-like nectarium inserted between each; and there are five separate capsules. There are four species: viz. 1. A. alpina, with long oval flowers, grows near Ingleborough hill in Yorkshire. The flowers are much larger than those of the garden columbine. 2. A. Canadensis, or Canada columbine, flowers almost a month before the other sorts, and therefore is preserved in the gardens of the curious, though not at all remarkable for its beauty. There is a variety of this with taller flower stems. 3. A. inversa, or garden columbine. Of this there are great varieties, not only in the color and fulness of their flowers, but also in their form. These are commonly called rose columbine; the colors are chestnut, blue, red, and white, and some are finely variegated with two colors. There are others with sharp-pointed petals in form of a star, and of these there are single and double flowers of the same colors with the former. 4. A. vulgaris, or wild columbine, with blue flowers, is found growing wild in some woods of England. All these species are propagated by sowing the seeds, or parting the old roots; but the former method is chiefly practised, for the old roots are very apt to degenerate. The seeds should be sown in a nursery bed in August or September; for those which are kept till the spring seldom grow well, or at least remain in the ground for a whole year. The spring following the plants will appear above ground, and should be kept clear of weeds; and, if the season proves dry, they must be watered. In the middle or latter end of May, they will be strong enough to transplant; for which purpose some beds of good undunged earth should be prepared, planting them therein at eight or nine inches distance from each other. In the following autumn, by which time the plants will have acquired strength enough to flower the year following, the roots should be carefully taken up and planted in the borders of the flower garden: but where their roots are designed to be preserved in perfection, all the flower stalks must be cut off as soon as the flowers are past. In order to keep up a succession of good flowers, fresh seeds should be sown every year; and it will likewise be advantageous to get an exchange of seeds from a distant place. Columbine has been looked upon as aperient; and was formerly in great esteem among the common people for throwing out the small-pox and measles. A distilled water, medicated vinegar, and conserve, were prepared from the flowers; but they have long given place to medicines of greater efficacy.

AQUILEIA, an ancient and large city of the Carni, or Veneti, in Italy, seated on the rivers Natiso and Turrus, about thirty miles west of Trieste. A Roman colony was settled in it between the first and second Macedonian wars, to be a bulwark against the neighbouring barbarians. It was afterwards increased with 2500 families by a decree of the senate; from which it became a very famous port. The emperor Julian ascribes the appellation to the augury of an eagle at the time of building it; but Isaac Vossius on Mela, to the great plenty of water, as if the town were called Aquilegia. The harbour at the mouth of the Natiso is distant sixty stadia from the city; so that ships of burden are towed up the river. In 452 it was besieged by Attila with an innumerable host of barbarians. The walls were assaulted by a formidable train of battering-rams, movable turrets, and engines that threw stones, darts, and fire; and the monarch of the Huns employed the forcible impulse of hope, fear, emulation, and interest, to subvert the only barrier which delayed the conquest of Italy. Aquileia was at that period one of the richest, the most populous, and the strongest of the maritime cities of the Adriatic coast. Three months were consumed without effect in the siege; till the want of provisions, and the clamor of his army, compelled Attila to relinquish the enterprise, and reluctantly to issue his orders that the troops should strike their tents the next morning and begin their retreat. But as he rode round the walls pensive, angry, and disappointed, he observed a stork preparing to leave her nest in one of the towers, and to fly with her infant family towards the country. He seized, with the ready penetration of a statesman, this trifling incident which chance had offered to superstition; and exclaimed in a loud and cheerful tone, that such a domestic bird, so constantly attached to human society, would never have abandoned her ancient seats unless those towers had been devoted to impending ruin and solitude. The favorable omen inspired an assurance of victory: the siege was renewed and prosecuted with fresh vigor; a large breach was made in the part of the wall from whence the stork had taken her flight; the Huns mounted to the assault with irresistible fury; and the succeeding generation could scarcely discover the ruins of Aquileia. An attempt was indeed made to restore it to its former grandeur in 1765; but owing to the unhealthiness of the situation, and other causes, it failed of success. In the place, however, which is still called Aquileia there are several inscriptions and antiquities to be seen, which are worthy of a traveller's notice: and, though dwindled into a poor village, it gives a title to the patriarch of Aquileia. The patriarch is named by the Venetians, and resides at Udina, because Aquileia belongs to the house of Austria.

AQUILICIUM, Aquælicium, or Aquilicia, in antiquity, a sacrifice celebrated among the Romans in time of excessive droughts, to obtain rain of the gods.

AQUILI Dii, an epithet of some of the heathen gods, supposed to be black complexioned.

AQUILIFER; from aquila, an eagle, and

fero, I bear; among the Romans, an ensign-bearer, who carried the standard on which the eagle was represented.

AQ'UILINE; Lat. *aquila*, an eagle. Curved like the beak of an eagle. Used as follows:

His nose was *aquiline*, his eyes were blue,
Ruddy his lips, and fresh and fair his hue.
Dryden's Palemon and Arcite.

Gryps signifies some kind of eagle or vulture; from whence the epithet grypus for an hooked or *aquiline* lose. *Brown.*

AQUILO is used by Vitruvius for the north-east wind; or that which blows at 45° from the north towards the east point of the horizon. The poets gave the name of aquilo to all stormy winds dreaded by the mariner.

AQUILONDI, or AQUILUNDA, a lake said to exist on the eastern frontier of the kingdom of Congo, which some writers even make the source of the Congo or Zaire; but the authenticity of the narrations concerning it are very much doubted.

AQUILUS, in ornithology, a species of pelican.

AQUIMINARIUM, in antiquity, a kind of lustral vessel, wherein the Romans carried their holy water for expiation, and other religious offices.

AQUINAS (St. Thomas), styled the Angelical Doctor, was of the ancient family of the counts of Aquino, descended from the kings of Sicily and Arragon; and was born in the castle of Aquino, in the Terra di Lavora in Italy, A. D. 1224 or 1225. He entered into the order of the Dominicans; and, after having taught school divinity in most of the universities of Italy, at last settled at Naples; where he spent the rest of his life in study, reading lectures, and acts of piety; and was so far from the views of ambition or profit, that he refused the archbishopric of that city when it was offered him by pope Clement IV. He died in 1274, leaving an amazing number of writings, which were printed at Venice in seventeen folio volumes, A. D. 1490. He was canonised by pope John XXII. in the year 1323; and Pius V., who was of the same order with him, gave him in 1567 the title of the Fifth Doctor of the church, and appointed his festival to be kept with the same solemnity as those of the other four doctors. His authority has always been of great importance in the schools of the Roman Catholics. Lord Herbert, in his life of Henry VIII., tells us, that one of the principal reasons which induced that king to write against Luther was, that the latter had spoken contemptuously of Aquinas. On a visit to Rome, Aquinas distinguished himself by a neat repartee: being in a closet with Innocent IV., when an officer brought in a large sum of money produced by the sale of absolutions and indulgences: "You see, young man," said the pope, "the age of the church is past in which she said 'Silver and gold have I none.'" "True, holy father," replied the doctor, "but the age is also past, when she could say to a paralytic—'Rise up, and walk.'"

AQUINO (Philip d'), called in Latin Aquinas or Aquinius, having turned from Judaism, had a pension from the clergy of France and acquired much reputation by his knowledge of the Hebrew language, which he taught at Paris in the reign of Louis XIII. as well as by his Dictionarium Hebræo-Chaldæo-Thalmudico-Rabbinicum.

AQUINO (Anthony d'), first physician to Louis XIV. and grandson of Philip D'Aquino.

AQUINO, a town of Italy, in the kingdom of Naples, and Terra di Lavora; a bishop's see but ruined by the emperor Conrade, and now consisting of about thirty-five houses. It was the birth-place of the poet Juvenal, and of Thomas Aquinas. It lies thirty miles north-west of Capua. Lon. 14° 30′ E., lat. 41° 32′ N.

AQUINUM, in ancient geography, a large municipal town, and a Roman colony on the borders of the Samnites, washed by the river Melpha. It is now called Aquino.

AQUIQUI, in natural history, the name of a particular species of monkey, called by the people of Brasil the king monkey, as being much larger than all the other monkeys.

AQUISGRANUM, one of the ancient names of AIX-LA-CHAPELLE (which see), so called from Claudius Granius, the brother of Nero, who frequented its baths and built a tower in it.

AQUITAINE, the ancient name of Guienne, a ci-devant province of France, which now forms the two departments of Gironde, and of Lot and Garonne. It formerly belonged to the kings of England, as descendants of William the Conqueror. Jersey and Guernsey are all that now belong to the king of Great Britain of the ancient dominions of Aquitaine and Normandy. See AQUITANIA and GUIENNE.

AQUITANIA, in ancient geography, one of the three principal divisions of Gallia Comata, described by Cæsar, as bounded by the Garonne, the Pyrenees, and the ocean: this is the Aquitania Vetus, or Cæsariana. Augustus set different boundaries, viz. the Loire, the Cevennes, the Pyrenees, and the ocean. It was called Gallia Aquitanica by Pliny, and the old Notitiæ, Provincia Aquitanica. It now comprises Guienne (which seems to be a corruption of Aquitania) and Gascony.

AQUO, in ichthyology, a name by which some authors have called the agonus, a fish much approaching to the nature of the alausa or shad.

AQUULA, the name of a disorder of the eyes, called also hydatis.

AR, in ancient geography, the metropolis of Moab, in Arabia Petræa, and the royal residence; situated on the east side of the river Arnon. It was called also Rabbi; and, to distinguish it from Rabba of the Ammonites, Rabbat Moab. On coins it is called Rabbath Moma. Eusebius says it was called Areopolis in his time from Ar and Polis. St. Jerome says that this city was entirely destroyed by an earthquake when he was a young man.

ARA, in astronomy, a southern constellation consisting of eight stars.

ARA, in ornithology, a generic name given by Brisson and Buffon to several psittaci of Linnæus. Also the name given by the natives of the Society Islands to the cuculus tahitius of Gmelin.

ARA PARVA, the little altar, a denomination in the ancient surgery, given to an elegant

kind of bandage, said to have been invented by Sostratus.

ARA THURIBULI, the altar of incense, in astronomy, a southern constellation not visible in our hemisphere, consisting, according to Ptolemy, of seven stars; and according to Sharp's catalogue, annexed to that of Mr. Flamsteed, of nine stars.

ARABANT AD CURIAM DOMINI; from aro, I plough; in law, was intended of those who held by the tenure of ploughing and tilling the lord's lands within the manor.

ARABESQUE, or ARABESK, something done after the manner of the Arabians. Arabesque, grotesque, and moresque, are terms applied to such paintings, ornaments of friezes, &c. wherein there are no human or animal figures, but which consist wholly of imaginary foliages, plants, stalks, &c. The words take their rise from hence, that the Moors, Arabs, and other Mahommedans use these kinds of ornaments; their religion forbidding them to make any images of men or other animals. Arabesc is used by Stephen Riou, Esq. in his book on Architecture, for that style of building vulgarly called modern Gothic, which he also terms Saracenic and Moresc; the introduction of which he ascribes to the Moors, Arabians, or Saracens. This manner of building was introduced into Europe through Spain. The crusades gave the Christians an idea of Arabic architecture, which they afterwards imitated. Sir C. Wren distinguishes the heavy Gothic as Anglo-Saxon, the lighter as Arabesc.

ARABIA.

ARABIA, in ancient and modern geography, a considerable country of Asia, of quadrangular appearance, forming by the proximity of the Euphrates to the Mediterranean one of the largest peninsulas in the world. It is bounded on the south by the Indian Ocean, on the west by the Red Sea, on the east by the gulf of Persia, and on the north by Syria and the river Euphrates. From the north-east extremity on this river to Cape Babelmandel, Arabia is 1500 miles in length: the southern coast, from the mouth of the Red Sea to the Persian Gulf, extends 1200 miles, and its breadth between Bussorah and Suez is 900. The country between the two last mentioned seas, is almost entirely a desert, and is occupied by tribes who have no fixed abode. This region, which extends northwards to the banks of the Euphrates, and westwards and eastwards to the confines of Syria, and the Arabian Irāk, is entirely occupied by Arab tribes, and is properly, at least in part, the Rocky Arabia (Petræa) of the ancients. The continual warfare and wandering habits of these tribes will readily account for the different limits assigned to Arabia by different ancient writers; but the most convenient division is that which would be formed by a line drawn from the head of the Arabian to the head of the Persian Gulf, nearly in the parallel of 30° north latitude. The earlier Greek geographers divided Arabia into two parts, the Happy and the Desert (Felix and Deserta). Ptolemy adds a third division, the Rocky (Petræa), and his partition has been generally followed. But the Arabia Petræa of Ptolemy is the southern part of the great Syrian Desert, and beyond the imaginary limit of Arabia assigned above. Arabia Felix contained the fertile, habitable regions to the south and west; Deserta, the barren countries intervening between them and the Syrian Desert.

Curious and learned etymologies have been given of the original name of this kingdom. Some affirm that the most ancient name was Kedem, the East; whence the Arabians were called Beni Kedem, 'Children of the East.' It was afterwards known by the name of Arabah, which some derive from the Hebrew ערב, arab, or ereb, signifying the west, a mixture, or merchandise, or traffic; others from Jarab, the son of Joktan, and grandson of Eber; and others again from Arabah, or Arbah, a district of Tehama, a desert, Ezek. xxv. 11. 21. Chron. ix. 14, inhabited by Ishmael. By the Syrians and many of the orientals it was called Arabistan; in our sacred books it is sometimes denominated the land of Cush. Moses styles the western Arabia Arabah, affording a presumption that the name was derived from its situation; and when the Ishmaelites reduced the adjacent parts, the appellation was applied to the whole peninsula. We learn from Scripture that the first part of the peninsula of the Arabs was divided into Kedem and Arabah; the former comprehending the Arabia Felix and Arabia Deserta of Ptolemy, and the latter the country called Arabia Petræa, from Petra its metropolis, by Ptolemy; Arabia Citerior, from its situation with respect to Italy, by Pliny; and Arabia Vetus by Stephanus and Procopius. Moses determines the boundaries of this kingdom, when he tells us that on the south it reached to the sea of Suph, or the Red Sea; on the west to Paran and Tophel; on the north to Laban, Hatseroth, and Di-zahab, that is to the borders of Syria; and on the east to Kadesh-Barnea, eleven days' journey from Mount Horeb. The first inhabitants of Arabah, or the western Arabia, were the Casluhim, descended from Mizraim, the Caphtorim, and the Horites, who occupied Mount Seir, before they were expelled from thence by Esau and his posterity. Afterwards Ishmael and his descendants settled here; and last of all, the Edomites or Idumæans. Kedem, or the eastern Arabia, was first peopled by the sons of Joktan, who are reputed the aboriginal Arabians; though, in process of time, the Ishmaelites spread themselves over this country. Some of the Cushites also gained early possession of part of it; and the children of Abraham by Keturah contributed, as sacred history informs us, to augment the number of its inhabitants.

The ancients seem mostly to have followed the geography of Ptolemy, who divides the superfices

of the peninsula into Arabia Felix, Arabia Petræa, and Arabia Deserta.

Present Divisions.—The present divisions of the country made by native geographers are as follow:—

1. Yemen, or Yaman, including the Happy Arabia of the Greeks, contains the districts of Mahrah, Hadramaūt, Yemen Proper, and Tehāyim el Yemen, in which is included the Sheh'r of Abū'l-fedā, the whole lying between 12° and 18° north latitude, 41° and 43° east longitude. 2. Hejāz, (Hedsjas, Hegias, or Hedjaz,) includes part of Rocky Arabia. It contains the celebrated cities of Mecca and Medīnah, and is the holy land of the Mussulmans 3. Nejed, (Nedsjed, or Nadjed,) between Hejaz and the Arabian Irāk, has the Syrian desert to the north, and Yemen to the south. At the N. W. extremity, Darayyeh, the head quarters of the Wahhābīs. The mountains of this country are fertile, but, like most of those in Arabia, deficient in water. 4. Yemāmah, or Arū'd, to the S. W. of Hejaz. 5. El Ahi'sā, or Hajar, (Lachsa, Hadsjar, or Hadschar,) between Bahreīn and Nejed, extending to Irāk Arabī on the north, and Omān on the south. 6. Bali'reīn (i. e. the two seas) includes the islands and a sandy district on the western shore of the Persian Gulf, famous for a considerable pearl fishery. 7. Omān, the eastern extremity of the peninsula, the capital of which is Maskat.

The Arabian landscape, generally speaking, is arid and sterile, destitute of cooling rivers and perennial lakes and springs to temper the climate and refresh vegetation. The hills are barren and unwooded; and the plains appear one continued wilderness spotted, like the deserts of Africa, with beautiful oases of verdure resembling islands. The shores, nevertheless, are fruitful, bordered by beautiful plains, which become of a deeper green in proportion as they approach the sea, where they are washed by warm vapors and showers, and rendered healthy and agreeable by cooling moisture.

Rivers.—The Euphrates and the Tigris to the north-east are almost the only rivers that water any part of the kingdom. Their other rivers are merely brooks and streams, occasioned by the mountain torrents, or periodical rains, and therefore dry up in the summer. That described in the maps as discharging its waters into the Persian Gulf, is an instance. Scarcely a single stream reaches the sea, and the course of the river near Sanâā, described in the map as passing through Hadramaūt and falling into the Indian Ocean at Khanjah, is without authority. The Prim, described as emptying itself near the Gulf of Curia Muria (i. e. Khurtān wa Murtān) should be written Terim, as appears, from Idrīsī. There are one or two saline lakes, surrounded by prominent hills, which relieve in some measure the general appearance of the peninsula. Vegetation lies fresh upon the banks, and the vapors which gather from these waters bathe the surrounding verdure, and revive the faded coloring of nature.

Mountains.—The mountains of Arabia run parallel with its shores; one important range excepted, which seems to stretch across from Bah'reīn on the east, to the vicinity of Mecca on the west. The most important chain runs in a direction parallel with the Red Sea. The hills of Oman appear to be a continuation of those on the other side of the Persian Gulf; and the isles of that gulf have been thought by some geographers to be summits of that range. In the country of Arabia Petræa is the celebrated mountain Sinai, the two lofty summits of which are composed of red granite; and a range of hills in the country of Hadramaūt; have been long celebrated for the production of frankincense. The Arabian mountains are for the most part craggy and precipitous, abounding with basaltic columns, calcareous rocks, gypsum, schistus, and iron stone.

Minerals.—Silver and gold are said to be found in the lead mines of Oman. Yemen produces the onyx, and Damar the sardonyx, cornelian and agate: alabaster, selenite, and various species of spars, are natives of Ajemen. Their pearls, together with most of their precious stones, spices, and metals, for which this country was so celebrated, are thought to have been for the most part imported from the Indies.

Vegetables.—Arabia, notwithstanding its arid temperature, presents some interesting objects for botanical investigation. The most remarkable belong to the genera of aloe, mesembryanthemum, euphorbia, stapelia, and falsola, and are refreshed only by the night dews. In the plains contiguous to the Red Sea are found many Indian and Persian plants, distinguished by their beauty and usefulness; among which may be enumerated the tamarind and cotton trees, the pomegranate, the banyan or Indian fig-tree, the sugar-cane, several species of melons and gourds, the coffee-tree, and the amyris opobalsamum, which yields the balm of Mecca. Of the palms, Arabia has several species, as the cocoa-nut, the date, and the great fan palm. It has also the orange, the sensitiva, the papaw, the mimosa nilotica, the bead-tree, the sycamore fig, the plantain, the almond, the apricot and peach, the recinus, the liquorice, the senna, the balsam, globe amaranth, the white lily, and the greater pancratium, with many other shrubs and herbs of beautiful appearance and delightful odor. Esculent roots and seeds are also found in considerable variety; and the celastrus-edulio, or kat tree, is common in the coffee plantations, the green leaves of which are chewed as a preservative from the plague. Agriculture is chiefly employed in the cultivation of wheat, maize, durra, barley, beans, lentils, rape, tobacco, indigo, uars (a plant used in dyeing yellow), and fua, which dyes a beautiful red So fruitful is the soil in some parts of Arabia that the inhabitants reap three successive harvests in the year. The different degrees of elevation, and consequently of temperature, produce a great diversity of vegetation. Forskal, in the small space of country which he examined, discovered several new genera; and had not the celebrated Seetzen fallen a victim to the rapacity and jealousy of the dōlah of Mokhā, he would have probably contributed greatly to our botanical knowledge of this celebrated country.

Quadrupeds.—The principal treasure of Arabia consists of flocks and herds. The oxen an-

cows are very similar to those of India, and have a hunch of fat above their shoulders. The flesh is ill flavored, and the latter yield little milk. The sheep are also ill flavored, and the wool indifferent. The goat yields milk in abundance; and in a measure supplies the deficiency occasioned by the comparative dryness of the cows. In the mountains of Arabia Petræa is found the rock-goat and the antelope, whose slight and elegant formation has been so justly celebrated in Oriental poetry. The Jerboa rat (yerbūû), the most beautiful of the opossum species, is common in the sandy deserts, together with lions, panthers, wild oxen, wild boars, hyænas, leopards, tigers, wolves, and almost every species of ferocious and predatory animals, who reign undisturbed in the deserts and occasionally descend, committing great ravage and slaughter among the flocks and herds. Numerous monkies are found in the woods of Yemen; jackals (benāt-el-wāwī) and foxes towards the Persian Gulf. The civet cat, musk rat, and various other animals are domesticated. Of all the quadrupeds of Arabia the horse is the most celebrated; the genuine breed of which is to be met with only amongst the Arabs of the desert. Zimmerman (Zool. Geog. 1777, 4to. p. 140.) asserts, that these animals are found wild in the deserts north of Hadramaūt, but owing to their fleetness and sagacity they are seldom taken. The horses of Arabia are distributed into two classes: the kadischi, or common kind; and the kochlani, or noble kind. The breed of the latter is an object of particular attention, and their genealogy has been preserved for 2000 years, descending, as they affirm, from the stalls of Solomon. The preservation of their breed is carefully and authentically witnessed. The grooms are very careful in preserving a register of all the sires and dams, by which the pedigree of a horse may be traced up to the most ancient date. The duke of Newcastle affirms that the ordinary price of an Arabian horse of the kochlani breed is from 1000 to £3000, and that the owners are as careful in preserving the genealogy of their horses as princes are in recording that of their families. The offspring of Kochlani stallions by the ignoble race, are considered kadischi, and are bold, powerful, and impetuous; and to great sagacity and affection add the capability of bearing great fatigue.

The camel is a native of Arabia, and is the most common beast of burden. There is also a superior breed of asses, sold at very high prices

Birds.—Arabia abounds with eagles, storks, vultures, falcons, plovers, and hawks. Numerous species of sea-fowl are found upon the coast of the Red Sea. Ostriches inhabit the deserts; and an island in the Arabian Gulf exhibits the native pelican. Of poultry they have almost every species: pigeons, partridges, pheasants, and bustards (olis hubārā), are common; and the Guinea fowl are so numerous in the hilly districts that the boys kill them with stones and take them to market. A bird of the thrush kind, denominated by Mr. Forskal 'turdus seleucus,' and by the natives 'samarman,' or 'samargog,' is useful in destroying locusts; and is thought to come annually from Khorasan.

Insects and Reptiles.—Arabia swarms with insects, many species of which have never been described. Locusts are both numerous and destructive: they are called by Mr. Forskal 'gryllus gregarius,' and are supposed to be different from the 'gryllus migratorius' of Linnæus. They are made an article of food, and the red sort are thought by the Arabs peculiarly delicious. In flying, the vast swarms of these creatures darken the air, making a tremendous noise, like that of a water-fall; and, when they alight upon a field, the verdure of it is soon consumed. There is also a small insect, commonly called 'arda,' (the 'termes fatale' of Linnæus,) which, by destroying the trees and herbage, is a great scourge to the country. A species of the 'scolopendra' is a great annoyance to the Arabians, tormenting those on whom it fixes with burning pains. 'The women are said to swallow three of these creatures fried in butter every morning and evening, in order to acquire that plumpness which, in the east, is thought a beauty.' Serpents are also numerous in this country, and of these the 'bætan' is the most formidable. It is about twelve inches long, spotted with black and white, and its bite is said to be so venemous as to produce instant death. The bruised leaves of the Aristolochia Sempervirens (Ghākah and Leēyyah) are said to be an antidote for the bite of serpents; and a decoction of them a sufficient preservative. The Arabian Gulf abounds with marine insects and fishes, many of the species of which have never been ascertained. The most numerous are priapi, salha, fistulares, medusa, &c. Mr. Forskal became more and more convinced, in the course of his observations, that the immense numbers of these animals contribute to produce the refulgence which is perceived at night in sea water.

Climate.—The climate of Arabia is various and the elevation of the interior relieves the excessive heats common in the same parallels of latitude, and renders frost and snow in the night not uncommon. Whilst the low sandy plains which stretch along the district of Tehamah, and the barren rocky provinces of Hejāz and Nejed, are intemperate in the summer, and are deluged with torrents of rain in the winter; at Mecca and Mokhā the drought and heat are such as would destroy all vegetation whatever, were it not for the falling of the heavy night dews. The province of Yeman, commonly known under the title of Arabia Felix, and celebrated by antiquity for the fertility and richness of the soil, and the happiness of its climate, is exsiccated by burning heats and destitute of inhabitants, except where the shade of mountains cools the temperature, and renders it healthy and agreeable. It is difficult to conceive how it acquired the name of happy. Hejaz, formerly known under the name of the Madranite, or Arabia Petræa, although its mountains are fertile, is perhaps the most barren and worthless province of the whole empire; and so parched as to afford neither water, fruits, nor genial harvests. It nevertheless ranks first in point of importance, partly from the resort of many thousand pilgrims, and partly from the influence of many memorable traditions; both which circumstances have largely contributed to

its wealth and celebrity. At Mecca, in this province, Mahomet was born; at Medina he found an asylum from his persecutions, and is said to have conversed with God. It was in Hejaz, the Arabians affirm, that the patriarch Abraham laid the foundation of the most ancient temple in the world: it was here that Ishmael retired when he left his father's house: it was here that Moses fled after he had killed the Egyptian, and became acquainted with Jethro, a priest of this province, whose daughter he afterwards married: it was here the angel appeared in the burning bush; and here are still to be seen the celebrated mountains of Horeb and Sinai, from which the Almighty delivered his laws to the ancient seed of Abraham. The waters of the rocks in this part of Arabia are said to be bitter.

The sandy province of Tehama being low in its situation, reflects the most vehement heat; but is nevertheless rendered fertile by the springs and rivulets everywhere to be found in it, and produces the luxuries of life in great abundance. The Nejed, or highland country, is extremely barren and but little known, consisting, probably, of a vast sandy plain, interspersed with naked rocks. There are in Arabia but two seasons in the year, the rainy and the dry, which, like the monsoons of India, are the converse of each other on the opposite sides of the peninsula, which proves the centre an elevated plain. The wind from the sea is accompanied by refreshing showers, while that from the deserts is dry and unwholesome. In the northern districts a pestilential wind is common, called sam or samiel, and is attended sometimes with great mortality. Its approach is indicated by an unusual redness in the air, upon which the Arabians immediately throw themselves flat upon the ground, and thus escape its deadly consequences.

Governments.—The governments of Arabia are divided among numerous imams and sheiks. That of Yemen is the best regulated, and affords a general idea of the others. The title of imam, denoting vicar, is ecclesiastical; and is considered synonymous with caliph and emir el mumenin, or prince of the faithful. The subordinate governments are under the direction of sheiks, a term signifying old man. The throne is hereditary; and the imam or emir is considered as supreme. The next in rank are the fakis, or gentlemen. The district governors are called dolas, and, if of noble birth, walis, a term which is almost synonymous with the Turkish pasha. The governor or chief magistrate of a small town is called sheik, and in villages hakim. The baskateb is the officer of the revenue; the cadis are judges in the several districts, and depend upon the chief cadi at Sana, as those of Turkey do on the mufti. The prince himself is the high priest.

Manners and Customs.—The people of Arabia are divided into two distinct classes, the inhabitants of the cities, and the inhabitants of the desert, commonly called Bedowins. In general they are of a middle stature, thin and sallow in their appearance, with black sparkling eyes. They drink no fermented liquors, and are abstemious in their diet; their chief articles of luxury consisting of coffee and pillau, which is made from fowl, or mutton boiled in rice. The smoking of tobacco and h'ashīshah (or hemp leaves) is common, by which they are often as much intoxicated as northern nations are by the improper use of stimulating liquors. At dinner they sit down upon the floor; and a piece of cloth or leather being placed before them, on which the dishes are set, they help themselves with their fingers. Their general mode of living, however, produces the most beneficial consequences, so that diseases are but little known among them; and the prevalence of the leprosy, in some places, can only be attributed to the ignorance of their physicians. The customs of anointing themselves, of burning incense, and of sprinkling their clothes with sweet-scented waters, are still common in Arabia, as in most Mahommedan countries. The houses are mostly built of stone; and the floors of the poor are spread with straw mats, those of the rich with fine carpets. The men generally inhabit the front of the houses, the women the back parts. The latter, according to the law of Mahommed, are kept in great seclusion; and when a stranger is introduced, the master of the house goes in before him, and cries, 'Tarik,' on which all females instantly retire. This, however, is not thought a hardship; retirement and concealment being as necessary in the eyes of Mahommedan women, as decent clothing in the eyes of an European. In marriage the Arabs are extremely careful with respect to the wife's virginity, which if they see reason to suspect, they demand a compensation from the father, and, in case of refusal, return his daughter. Polygamy is allowed, but not generally practised. The rich voluptuous, however, on some occasions, marry as many as four wives, and keep a number of concubines. A lawful wife enjoys considerable liberty and power in the family, and is entitled to demand a divorce whenever she considers herself used ill by her husband, in which case the whole of her property is reserved to her.

Gravity, which has always been a distinguishing feature in the Arabs, is in a great measure the effect of education. Boys leave the haram, where they were under the instruction of the women, at about the age of seven or eight years; after which they are accustomed to think and speak as men, and pass whole days in the company of their fathers and preceptors. Circumcision is practised upon both sexes. Dancing and music are esteemed indecent, and thus the mind, from the earliest dawn of reason, is trained to pensive and serious habits. An Arab seldom laughs but strokes his beard.

The dress of the Arabs is light and simple, consisting for the most part of a blue and white striped shirt, with wide sleeves, large white trowsers, a short jacket without sleeves, a leathern girdle, a capot thrown over the shoulders, a turban, consisting of a cap, with a shawl twisted round it, and a pair of slippers: a short knife is also stuck into their girdle, and the poor carry their smoking utensils there. The dress of both sexes is extremely similar, with the exception of veils, nose and ear-rings, anclé-rings, bracelets, &c. which are peculiar to the women; who, in addition to these ornaments, are at considerable

pains to heighten their beauty by making black punctures in the face, staining the circle of the eyes and eye-lashes with black-lead ore, or stibium, and their nails with the red juice of the alhenna. Their lips, feet, and hands are stained of tile color, the different shades of which indicate their several degrees of rank and situation.

The Arabians, in their disposition, are said to be very revengeful, and are particularly jealous of the honor of their women, and their beards. An indecent action or a contemptuous word can only be expiated by the blood of the offender; they will wait whole months and years for an opportunity of retaliation; and, in cases of gross insult, will take vengeance on the relations of the offender. They look upon robbery as an act of retributive justice; and they apply the principle as well to individuals as caravans. When an Arab sees a stranger, he rides up to him, and says, 'Undress thyself, thy aunt (my wife) is without a garment;' and a ready submission prevents any further injury. They pretend, that in the division of the earth, the rich and fertile climates were given to the other branches of the human family, and that the posterity of Ishmael may recover, by fraud, the inheritance of which their progenitor was unjustly deprived. Upon this principle they proceed to licentiousness of rapine and plunder, without even the consciousness that they are doing wrong; but in case of murder the accused must undergo the operation of licking a hot iron with his tongue, and if burnt, he is considered guilty, and pays a camel to the judge.

There is, however, a mixture of hospitality and beneficence in all their cruelty. Fires are lighted up at night in the inhabited districts for the use of travellers that have lost their way, or are fatigued with their journey; who, on retiring to these stations, are politely received and entertained till the morning, when they are sent on their way. The man just robbed by the Arabs, by becoming suppliant and submissive, has been introduced to their tents, refreshed with the provisions of his host, and the next morning sent on his journey with blessings and with gifts. The hospitality described by Homer is still common in the tents of the Arabians, while those who live in cities have greatly degenerated by the exactions and oppressions of their numerous princes and priests. A tradition, still extant in their national records, is beautifully descriptive of the character and heroism of the Arabians: Three men, disputing in the court of Caaba, Who was the most beneficent of the Arabs, singled out three: Abdallah, Kais, and Arabah; to one of whom they all agreed that tribute was justly due, although to which was a point in which no two could coalesce in opinion. In order to ascertain this, they resolved to make the experiment. The first went to Abdallah, who was about to commence a journey, and was then in the act of mounting his camel. 'Son of the uncle of the apostle of God,' said he, 'I am a traveller, and in distress.' The patriarch instantly dismounted, presented the pilgrim with a camel, its rich caparison, some robes of silk, 100 pieces of gold, and a sword of still greater value. The second went to Kais, and on his arrival a servant told him that his master was asleep, but gave him 7000 pieces of gold, assuring him that was all the money in the house, and directed him to go to those who kept his master's camels, and request a camel and a slave. Kais when he awoke, for this generous act, gave the slave his freedom, lamenting that he had not waked him, adding, that if he had been awake, he should have given him more. The third person went to Arabah, who, being blind, was leaning on two slaves on his way to attend prayer at the mosque. He lamented that he had no money, but insisted on his taking the two slaves, and groped along by the wall. The Mahommedan moralisers unanimously voted the last the most generous of the three.

In addition to their hospitality, the Arabs are commonly celebrated for the great affection subsisting between parents and children, and for the sanctity with which they observe an oath, a violation of which dooms the perpetrator to imperishable ignominy; and they are said to sign their alliances in blood, that they may be more impressed by the obligation of observing them.

In politeness the Arabs vie with the Persians, and imitate that people in their general manners, as European nations do the French. The form of their visits is attended with much etiquette. Subjects are not allowed to sit down in the presence of the imam, as appears from Niebuhr's plates of his audience at Sanâā. According to the common courtesy, inferiors kiss the hand of their superiors, equals embrace by putting cheek to cheek. The common salutation is Es-salām âleikum, 'God save you;' a compliment which they refuse to Christians. They commonly sit cross-legged, and in the presence of their superiors sit upon their heels.

History.—The early mode of patriarchal government among the Arabs, clearly proves them to be a very ancient people, and must have prevailed in the ages bordering on the deluge. Their history divides them into two classes, the old lost Arabians and the present.

The former were very numerous, and the most famous of them were Ad, Thamud, Tasm, Jadis, the former Jorham, and Amalek; and are supposed to have sunk in the mass of the other tribes. The present Arabians are sprung from three stocks; two of them Kahtan, or Joktan, the son of Eber, and Adnan, descended in a direct line of genealogy from Ishmael: the descendants of the former are called Al Arabi, or the pure Arabians; the latter Al Arab al Mostareba, naturalised, or insititious Arabs. The third class are said to have been descended from Cush, the son of Ham, whose posterity inhabited the banks of the Euphrates and the Persian Gulf, after they left Chuzestan or Susiana, the original settlement of their father.

Yarab, one of Joktan's sons, after the confusion of languages at Babel, succeeded his father in the kingdom of Yemen; whilst Jorham, his brother, founded the kingdom of Hejaz, where his posterity filled the throne till the time of Ishmael. The kingdom of Yemen, after having been long governed by princes of the tribe of Hamyar, son of Saba, and great-grandson of Joktan, passed to the posterity of Cahlan his brother, still retaining the title of king of the Hamyarites, called

by the Greeks Homerites. After this kingdom had stood 2020 years, the inundation of Aram, soon after the time of Alexander the Great, dislodged many of the tribes, who, in their migration, founded the kingdoms of Ghassan and Hira. The founders of the former in Syria Damascena reigned, according to Abulfeda, something more than 600 years. Five of these princes were called Hareth; according to the Greeks Aretas. A governor of one of these was the person who ordered the gates to be shut to apprehend the apostle Paul, when he was let down out of a window by a basket and effected his escape. The kingdom of Hira, founded in Irak or Chaldea, continued nearly 630 years, till the caliphate of Abubeker.

The kingdom of Hejaz remained in possession of the posterity of Jorham till the time of Ishmael, who married the daughter of prince Modad, and had twelve sons, to one of whom, Kidar, the crown was bequeathed. Some historians, however, observe that the posterity of Ishmael expelled the Jorhamites, and the latter returning to Johainah were destroyed by an inundation. At Mecca an aristocracy prevailed; but the tribe of Koreish retained the chief management till the time of the celebrated Mahommed. The Egyptians, Persians, Greeks, and Romans, have made fruitless efforts to subdue them; but the people still remain a living testimony to the truth of the Scriptures, and a fulfilment of the original prophecy with respect to Ishmael and his posterity.

The learning of the Arabians is neither very extensive nor profound. The seeds of the sciences seem, nevertheless, to have sprung up in Arabia before they were known to other nations. Roving under a serene sky, tending their flocks on the open plains or on the tops of mountains, it was natural to suppose they would observe the rising and setting of the stars, the changes of the moon, together with the different appearances and situations of the planets. Different from all other nations, whose observations have been commonly confined to the planets, they restricted themselves chiefly to the consideration of the fixed stars. They are thought to have named the constellations, which are called after the different species of animals known in these parts. The stars by which they chiefly observed the weather were twenty-eight in number, and were called 'Anwa,' or houses of the moon. These divided the zodiac into so many parts, through each of which the moon passes every night; and observing the changes of the atmosphere to depend in a great measure upon the relative situations of these, they ascribed to them a divine power, and used to say, the rain was from such and such a star. From these considerations they afterwards diverged into the practice of astrology and the occult sciences, which are still in high estimation among the Arabs; but in the grave sciences, which depend upon serious calculations, they have never distinguished themselves; these, having little of the marvellous, did not suit the genius of a people whose imaginations, being warm, could only be captivated by irregularities and astonishment.

The extensive circulation of the Arabic language, in consequence of the conquests of Mahommed, have rendered it an object of polite attention among the learned in Europe. It is derived from the same stock with the Hebrew, Syriac, and Chaldaic, tongues; and bears the same affinity to the Hebrew as the Doric does to the Attic Greek; and it is affirmed by learned authority, that in its original and unsophisticated state it was pure Hebrew. The natives ascribe it to Kahtan (the Joktan of Scripture), the father of Yemen, and son of Eber. Its name and grammatical construction to Yarab, son of Joktan, supposed to be the same that is mentioned Gen. x. 26. See Hunt. Orat. de Antiq. et Eleg. Ling. Arab. p. 1. Bochart in Geog. Sacr. c. ii. c. 15. Golius in Lex. Arab. Schultens in Orig. Hebr. Pococke Spec. Hist. Arab. p. 29. It belongs to the class of languages called by the German philologers, Semitic; and, together with the Ethiopic, forms the southern division of it. It is, however, one of the most ancient languages in the world; and since the Arabs have inhabited this country almost from the deluge, without intermixing with other nations, their speech must have been formed about the time of the confusion of languages at Babel; although the earliest specimens which have been preserved do not extend much higher than the time of Mahomet.

The language is said to have descended from the deluge, a period of 3000 years, in its original purity; the changes and supplementary idioms acquired by intercourse with neighbouring nations having varied nothing more than the circumstantial inflexions and dialects; while the substance of the language, comprehending its letters, government, and prosody, remained entire. The learned Dr. Robertson, professor of oriental languages in the University of Edinburgh, has prefixed to his Clavis Pentateuchi, a dissertation De Origine, Antiquitate, Conservatione, Indole, et Utilitate Linguæ Arabicæ, in which he powerfully advocates the purity of the Arabic. The learned Schultens also, in his Orig. Heb. vol. ii. p. 20, 21. Orat. Ling. Arab. 28, and many others, are of the same opinion. Their chief arguments are drawn from the Arabic language itself, the structure of which they affirm is eminently adapted to the preservation of its genius; and its nature, too isolated to coalesce very readily with other tongues, and degenerate, as the French and Italian have done, from the purity of the Latin.

Mahomet maintains that the language of the Koran was the same as that anciently used by Abraham and Ishmael; and Dr. Robertson considers the language used by the prophet the same as that used by the Joktanites and Ishmaelites; in confirmation of which he refers to ancient monuments found near Aden, in Arabia Felix; an account of which was published by Schultens in his Monumenta Vetustiora Arabiæ, 4to. Leyden, 1740; and also to seven poems suspended in the temple of Mecca, entitled Moallekat, copies of which are extant at Paris and Leyden. Hyde also considers it the most unmixed of all languages, with the exception of a few Persian and Latin terms, perfectly pure; which he ascribes to the number of books and writers, to the great care of the Arabs in the cultivation of it, to the very great love of poetry and eloquence, and to

the peculiarities of their local and political situation.

The copiousness of this language is so great, that the Arabians affirm, no uninspired person can be a perfect master of it. It had originally 500 names for a lion, and above 1000 for a sword. Dr. Robertson observes, that the genius of the Arabic resembles the Hebrew, its primitive words being composed of different combinations of consonants by triads; on which principle the various combinations and copulations of three letters form more than 10,000 roots, independent of those which may arise from the collision of gutturals. Sir William Jones, in the Asiatic Researches, vol. ii. p. 6. observes that the Arabic roots being triliteral, the composition of the twenty-eight letters of the alphabet would give 22,000 elements of the language; and although many of its roots are lost, if we nevertheless suppose 10,000 of them to exist, independent of quadriliterals, and each of these admitting of only five variations, we shall then have an aggregate of 50,000 words, each of which may receive a multitude of changes by the rules of grammar. This consideration alone shows the surprising extent of the language. The Arabians, however, confess that the greatest part of their language has been lost, an opinion which is rendered probable from the late period in which the art of writing was introduced among them. Learning has also been on the decline for the last four centuries in Asia, and the Arabic has suffered a proportionate deterioration. Many of its grammatical forms have decayed; its copiousness of expression has been contracted; the dual number has nearly fallen into disuse, and words generally used in the literal Arabic are now used only in the dialects of particular provinces. The relation of ancient to modern Arabic has been compared to that of the Greek in the age of Pericles, to the style of the most recent Byzantine authors. Gruber's Encyclopædia and Gesenius in Ersch. But as the more polished Arabs, like the Greeks of the lower empire, employed the literal Arabic in their literary and epistolary correspondence, much of the copiousness and beauty of the language still remains in the higher circles; and a modern letter is essentially the same as one written eleven hundred years ago. The language of the common people is, nevertheless, extremely provincial and deteriorated. The passive voice is seldom used; and the personal pronouns are united with the word to which they belong, by a particle rarely used in the pure Arabic metââ; (tââ in Maltesse) ktât m'tââî for blââ in the western dialects kitâbî, my book; ktâb btââ, 'l ab, for kitab'l-ab, the father's book. The dialects of some provinces are much more corrupt than those of others. Those in the north-west of Africa and Malta are the most corrupt of any, and are distorted by transpositions, and disfigured by barbarisms, distortions, Spanish and Berber words. Such, however, is the effect of reading the Koran, and the languages derived from it, that according to Burckhardt, the sheikiyyah transcribe with as much elegance as the best scribes in Cairo. The principal dialects were those of Il'imyar (or Homeîr, whence the Homeritæ), and that of Koneîsh; the former spoken in Yemen and the south, the latter in the north-west; and is referred to Ishmael as its author, who, as Dr. Pococke imagines, after he had married into the family of Jorham, formed it of their language, and the original Hebrew. The Himyaritic greatly resembled the Ethiopic and Syriac, and was more remote from the true genius of the Arabic than the Koreîsh. The latter is said to have been the pure Arabic, conforming to the native Hebrew. It was one of the most polite and finished of the oriental languages, being spoken in Mecca, the centre of Arabia; where the natives had little intercourse with foreigners, and that country being frequented by Arabs from all the provinces. The Koreîsh, from the conversations and verses of their brethren, took the purest and most elegant expressions, and thus the beauties of the whole tongue were transfused into a single dialect, and the Koreîsh became the purest, richest, and most polite of all the Arabian idioms. In this language the Koran was written; by which means it became studied in all parts of the continent, and current as far as the prophet's voice was heard.

The spoken language of the Koreîsh is more nearly allied to the Hebrew than the written language, which the following observations perhaps will sufficiently illustrate. Every noun in the Hebrew or Syriac terminates in a consonant or long vowel, without a change of termination, as in the Greek and Latin, to indicate a change of case. In this respect the spoken Arabic corresponds with them; melik, for instance, signifies rex, regis, regi, and yemlik, answering to the Latin verb regno, with or without a negative. But it is otherwise with the written language, for this takes a short vowel at the end of the word, changes the case in nouns, and the mode in verbs; thus meliker signifies rex, a king; meliki regis, of a king; melika regem, a king; yemliku, he does, or he will reign; yemlika, he may reign; lan yemlik, he shall not reign. To this it has been objected that the terminations, being marked in short vowels, which are not usually expressed in their writings, are merely optional and arbitrary. Such words as abî, abâ, fî, and fâ, discover the same distinction by long vowels, which are always expressed; and the most ancient poems exhibit the use of the tenwin, or nasal termination of the final vowels; all which considerations demonstrate the use of these terminations much more ancient than Michaelis and other philologists supposed.

There was also considerable variation in the pronunciation of letters, not only in the different dialects, but even in the same dialect. Further information on this subject may be found in *De Sacy's Grammaire Arabe*, I. p. 18, sq. *Wahl's Elementrabuch*, p. 54, *Arab.*; *Anthologie*, p. 12, sqq.; *Herbiu's Principes*, Pref. ii. sqq.; *Aryda's Arab. Gramm. Savary's Grammaire Arabe, par Langlès*; *Dombay Gramm, Mauro Arabica.*

The principal modern dialects are as follow: 1. The Syriac, which in addition to its containing many peculiar words, is of a softer enunciation than the Egyptian. See Aryda's Arab.

Gramm. Gr. Arab. Maronitarum; Anton. ab Aquila Arab. Ling. Novæ et Method. Institut; Fabbrica ovvero Dittionario della Lingua Volgare Arabica dat P. Germano de Silesia, &c. It prefixes *b* or *m* to the first person future. 2. The Egyptian, which is a purer dialect, and uses maye for ma, water; and pronouns jēm and kāt like g. Savary's Grammaire de l'Arab Vulgaire published by Langlès; Ruphy Dictionaire François Arabe. 3. The Tripolitine, which is very corrupt, many foreign words having been introduced, and the sounds elif and aīn confounded. Lyon's Travels in Northern Africa, passim; Tully's Narrative of a Ten Years' Residence at Tripoli. 4. The Algerine, which is similar to the Tripolitine. Dombay's Gramm. Mauro-Arabica. 5. The dialect of Melinda (Adelung's Mithridates; p. 382. iv. 112), which is pure Arabic, or nearly so, a specimen of which is given by D'Avity. 6. The dialect of Felh'ān in the territory of Sheh'r, which according to Ibu Batūtah adds the syllable lā to every word. There are also other dialects as Yemen, Oman, Mapulian, &c. of which there is nothing remarkable mentioned by late travellers. Niebuhr's Beschreibung von Arabian, p. 83. sqq. &c.

Since the time of Mahomet all the dialects of the Arabic have been less pure, and even the Koran now is become a dead language, and studied only in colleges as Greek and Hebrew by Europeans.

Writing is said to have been known among the Hamyarites at a very early period. The characters, however, were greatly perplexed, and the alphabet corresponded in number and order to the letters of the Hebrew. Chardin thinks that vowel points were also known among them. Some ancient inscriptions are said to be still remaining of this character upon monuments, to which Job is supposed to refer, ch. xix. v. 23, 24. Some authors have imagined that the Arabs were the inventors of letters, and Sir Isaac Newton imagines Moses learned the alphabet from the Midianites, who were Arabians. The present characters were invented by Moramer Ebn Morra, of Anbar, a city of Irak, and brought to Mecca by Bashar the Kendian just before the time of Mahomet, and called the Cufic character from Cufa a city of Irak. These were improved by Abuali Ebn Moklah, vizier to the caliph of Bagdad, 300 years after Mahomet, and perfected by Ali Ebn Bowab, who died A. D. 1022. Vowel points are said to have been introduced about the tenth century. The Arabians seem to have had considerable sensibility to the beauties of poetry and eloquence. They allowed no nation to understand the art of public speaking except themselves. Their sentences had little connexion, and struck the people mostly by the full swell of the periods, the elegance of the expressions, and the acute proverbs which they commonly contained. The apologue was commonly employed by the Arabian orators. Their poetry far exceeds the Koran in composition; it is daring, rapid, sublime, and delights in astonishing the mind and filling it with lofty ideas. The only remains of the ancient history of the Arabs is a collection of poems, in which the laws of Arabian prosody are strictly observed. See Sir W. Jones in As. Res. 2. 4. 8vo. Al Khatēl ibu Ah'med a Ferāhīdī lived in the eighth century, and is said to have been the first who collected the principles of Arabian prosody into regular laws. The technical terms employed were supplied from the same source as their imagery. Every verse or distich is called bērt or tent, and consists of two hemistichs or misrās, wings of a folding door, corresponding with each other in measure, and often in sentiment and expression. In the same poem all the distichs have a similar measure or termination, kāfiyeh; and in the ghazals and kāsīdahs, or sonnets and elegies, the two first hemistichs also rhyme. The agreement of rhyme should extend to the three last letters. The metres, ejza, consist of three or five syllables called sebebon wated, ropes or stakes, to pin down the sides of the bērt or tent. Quantity is determined in the following manner: Every syllable consisting of a consonant followed by a short vowel is a short foot, if another consonant be added it becomes a long foot; thus *me* is a short syllable, *med* is a long one; and mĕdīnun is a bacchius, medfūnun a molossus: quiescent letters are considered as consonants. There are no fewer than sixteen different kinds of versification or metres, which are called Buh'ūr, seas; and these have various subdivisions and licences. The Arabs delight in rhyming cadences, a sort of measured prose, and the constant recurrence of those transcendent beauties it is that renders the Koran so highly esteemed among the Arabians. The paronomasia, or play upon words, and the antithesis, are rhetorical figures in which they delight, beauties for which Asiatic compositions have always been distinguished, and which, when properly employed, will always be read with pleasure, so long as human nature has taste to relish, or wisdom to direct its admiration.

Little comparatively is known of Arabian history after the decline of the Roman empire. Mahomet, propagating his doctrine by the sword, converted great numbers, and opened a new era in 621, called the hegira by his followers. After Mahomet several sovereigns appeared upon the stage. In 1720 a sheik called Mahomet Ibu Abdoulwehhab was born, who propagated doctrines of reformation. Having converted Ibu Saaoud, prince or grand sheik of the Arabs, about 1747, the new principles were extended, towns reduced to ashes, and immense multitudes of people massacred. Abdelaazis, son of Saaoud, sent his son Saaoud in the beginning of the present century to take Mecca. He rased every thing to the ground except the sacred temple, and afterwards took Medina; and on the assassination of his father in that city took possession of the immense treasures which had been accumulating for ages, and is now master of the whole of Arabia.

ARABICI, a sect who sprung up in Arabia, about A.D. 207, whose distinguishing tenet was, that the soul died with the body, and also rose again with it. Eusebius relates that a council was called to stop the progress of this rising sect; and that Origen assisted at it, and convinced them so thoroughly of their error that they abjured it. Vide *Euseb.* l. vi. c. 37.

ARABICUM Gummi, in chemistry, gum Arabic.

ARABICUS Lapis, in mineralogy, a stone like ivory, blemished with spots.

Arabicus Sinus, the Red Sea.

ARABIS, in botany, bastard tower-mustard, a genus of the siliquosa order, and tetradynamia class of plants; ranking in the natural method under the thirty-ninth order, siliquosæ. The generic marks consist in four nectiferous glands, which lie on the inside of each leaf of the calyx. There are eight species; but none of them remarkable for their beauty or their properties. Only one of these, viz. A. thaliana, or the mouse-ear, is a native of Britain. It is a low plant, seldom rising more than four or five inches high, branching on every side, and having small white flowers growing alternately, which have each four petals in form of a cross, succeeded by long slender pods filled with small round seeds. It grows naturally on sandy ground or old walls. Sheep are not fond of it, and swine refuse it.

AR'ABLE, } Lat. *aro*, to plough. Land
Ara'tion. } which has been, or may be ploughed.

His eyes he opened, and beheld a field,
Part *arable*, and tilth; whereon were sheaves
New reap'd. *Milton.*

But if the sullen earth, so press'd, repines
Within its native mansion to retire,
And stays without, a heap of heavy mire;
'Tis good for *arable*, a glebe that asks
Tough teams of oxen, and laborious tasks.
Dryden's Virgil, Geor. ii.

Having but very little *arable* land they are forced to fetch all their corn from foreign countries.
Addison.

Arable Land, anciently called Aralia; from arare, to plow; land for tillage or ploughing, or which has been ploughed up.

ARABOG, a sea-port town of Arabia, on the Red Sea, at the northern extremity of Beled el Haram, or the Holy Land of the Mahommedans. The first ceremonial of the pilgrimage to Mecca commences here, or bathing in the sea, and making a general ablution with the water and sand, repeating a prayer while naked, and being clothed in a garment without a seam. Long. 38° 52′. E. lat. 22° 31′ N.

ARABS, in entomology, a species of eastern Tenebrio. It is black; thorax serrated; antennæ and legs testaceous brown. Fabricius. Gmelin.

Arabs, a species of cimex found in South America. The thorax is spinous; body ovate, livid; end of the abdomen bidentated. Linn. Fab. Gmel. It is called by Sloane, cimex sylvestris fœtens viridis triangularis.

Arabs, in ornithology, a species of otis that inhabits Arabia Felix, which Dr. Latham concludes to be the flying ostrich of Le Maire and Adanson; though Buffon supposes that bird to be the Linnæan otis atra. Its specific character is very concise, 'ears with erect crests.' Gmelin. Brisson calls it l'outarde d'Arabie; and Buffon, le lohong, ou l'outarde husspé d'Arabie; it is likewise the Arabian bustard of Edwards and Latham.

ARAC, or Arrack. See Arack.

ARACA-PUDA, in botany, a species of the drosera of Linnæus.—Araca guam, a species of the goava tree.—Araca miro, a shrub growing in Brasil, the fruit of which has a sweetish musky taste, and somewhat the savour of mulberries.

ARACAN, or Reccan. See Arracan.

ARACARI, in ornithology, the name of a Brasilian bird of the woodpecker kind. It is of the size of our common green woodpecker, and has a very large, sharp, and somewhat hooked beak. See Picus.

Aracari, a river of South America, which enters Rio Negro. It is also the name of a town on the Rio Negro, and of a small island on the coast of Brasil.

ARACHIS, in botany, a genus of the diadelphia order, and decandria class of plants; ranking in the natural method under the thirty-second order, papilionaceæ. There is only one species, viz. A. hypogea, an annual plant, and a native of Brasil and Peru. The stalks are long, trail upon the ground, and are furnished with winged leaves, composed of four hairy lobes each. The flowers produced singly on long peduncles, are yellow, of the pea kind, and each contains ten awl-shaped stamina, nine of which are tied together, and the upper one stands off. In the centre is an awl-shaped stylus, crowned with a simple stigma. The germen is oblong, and becomes an oval oblong pod, containing two or three oblong blunt seeds. This plant is cultivated in all the American settlements for the seeds, which make a considerable part of the food of the slaves. The manner of perfecting them is very singular; for as the flowers fall off, the young pods are forced into the ground by a natural motion of the stalks, and there they are entirely buried, and not to be discovered without digging for them; whence they have obtained the name of ground nuts.

ARACHNE, in fabulous history, a young maid of Lydia, the daughter of Idmon, said to have been the inventress of spinning. She is fabled to have been so skilful in this art, as to have challenged Minerva at it; who tore her work, and struck her; which disgrace driving her to despair, she hanged herself. Minerva, from compassion, brought her to life, and transformed her into a spider, which still employs itself in spinning.

ARACHNIDES, in zoology, a class of animals, between the crustacea and insecta, and including the Linnean genera oniscus, julus, scolopendra, lepisma, podura, pediculus, scorpio, aranea, phalangium, acarus, hydrachna. See Zoology.

ARACHNOID Membrane, membrana arachnoidea; from *αραχνη*, a spider, and *ειδος*, likeness; so named from its resemblance to a spider's web. 1. A delicate membrane of the brain, situated between the dura and pia mater, and surrounding the cerebrum, cerebellum, medulla

oblongata, and medulla spinalis. 2. The crystalline lens and vitreous humor of the eye. Also an appellation given to one of the coverings of the spinal marrow. See ANATOMY, Index.

ARACHNOIDES, in natural history, the name of one of the genera of the echini marini; the distinguishing characters of which are, that it is of a circular circumference, but variously broken in at the edges. The mouth is round, and placed in the centre of the base, and the aperture for the anus is quadrangular, and situated in one of the sides, on the upper superfices, but near the edge.

ARACHNOIDES, a species of madrepora, found fossil: the stars are very small, crowded, and flattened; the rays undulated, short, and equal.

ARACHNOIDEUS, in botany, cob-webbed; an epithet for the ring of the fungi, which is composed of a very white web; also of a leaf, a peduncle, and a calyx, when they are covered with a thick interwoven pubescence, resembling a cob-web.

ARACK, ARRACK, or RACK, a spirituous liquor imported from the East Indies, used by way of dram and in punch. The word arack, according to Mr. Lockyer, is an Indian name for strong waters of all kinds; for they call our spirits and brandy English arack. But what we understand by the name arack, he affirms is really no other than a spirit procured by distillation from a vegetable juice called toddy, which flows by incisions out of the cocoa-nut tree, like the birch juice procured among us. The toddy is a pleasant drink by itself, when new; when stale, it is heady, and makes good vinegar. The English, at Madras, use it as leaven to raise their bread with. There are several kinds of arack distinguished by different names, either from the places where they are made, or from their color or quality: such as,

ARACK, BATAVIA, said to be a vinous spirit obtained by distillation from rice and sugar, fermented with the juice of cocoa-nuts. It is a strong spirit, but being made in copper stills, is not so agreeable as the Goa arack.

ARACK, BITTER; ARACK, BLACK, two kinds, little known in Europe.

ARACK, COLUMBO, a hot spirit, little valued and seldom imported.

ARACK, GOA, is said to be made from the toddy; there is likewise a kind of shrub from which it is made. Goa and Batavia are the chief places for arack. At Goa it is to be obtained, single, double, and treble distilled. The double distilled, which is that commonly sent abroad, is but a weak spirit in comparison with Batavia arack; yet, on account of its peculiar and agreeable flavor, is preferred to all the other aracks of India. Its flavor is attributed to the earthen vessels used at Goa to draw the spirit; whereas at Batavia they use copper stills. In the best Goa arack the spirits of the cocoa juice make about a sixth or an eighth part. The manner of making it is said to be this: The juice of the trees is not procured in the way of tapping; but the operator provides himself with earthen pots, having bellies and necks like our ordinary bird bottles, and makes fast a number of these to his girdle. Thus equipped, he climbs up the trunk of a cocoa tree in the evening; when he takes out a knife, and cutting off one of the small knots or buttons, applies the mouth of the bottle to the wound, fastening it to the bough with a bandage; in the same manner he cuts off other buttons, and fastens on his pots, till the whole number is used. Descending the tree, he now leaves them till the morning; when he takes off the bottles, which are mostly filled, and empties the juice into the proper receptacle. This is repeated every night, till a sufficient quantity is produced; and the whole being then put together, is left to ferment, which it soon does. When the fermentation is over, and the liquor or wash becomes a little tart, it is put into the still, and a fire being made, the still is suffered to work as long as that which comes over has any considerable taste of spirit. The liquor thus procured is the low wine of arack; and this is so poor that it will soon corrupt and spoil, if not distilled again, to separate some of its phlegm; they therefore immediately after pour back this low wine into the still, and rectify it to that very weak kind of proof spirit, in which state we find it. The arack we meet with, notwithstanding its being a proof test, according to the way of judging by the crown of bubbles, holds but a sixth, and sometimes but an eighth, part of alcohol or pure spirit; whereas our other spirits, when they show that proof, are generally esteemed to be one-half pure spirit. There is a paper of observations on arack, in the Melanges d'Histoire Natur. tom. v. p. 302. By fermenting, distilling, and rectifying the juice of the American maple, which has much the same taste as that of the cocoa, the author says he made arack not in the least inferior to any that comes from the East Indies; and he thinks the juice of the sycamore and of the birch trees would equally answer the end.

By stat. 11th, Geo. I. c. 30, arack on board a ship, within the limits of any port of Great Britain, may be searched for and seized, together with the package; or if found unshipping or unshipped, before entry, may be seized by the officers of excise, in like manner as by the officers of the customs. Upon an excise officer's suspicion of the concealment of arack, and oath made of the grounds of such suspicion before the commissioners or a justice of peace, they may empower him to enter such suspected places, and seize the liquors, with the casks, &c. If the officers are obstructed, the penalty is £100. Arack is not to be sold but in warehouses, entered as directed in the 6th of Geo. I. cap. 21, upon forfeiture, and casks, &c. If permits are not returned, which are granted for the removal of arack; or if the goods are not sent away within the time limited, the penalty is treble the value. If the permits are not retained, and the decrease is not found to be sufficient, the like quantity is forfeited. Permits are not to be taken out but by direction in writing of the proprietor of the stock, or his known servant, upon forfeiture of £50, or three months imprisonment. By stat. 9th, Geo. II. c. 35, if arack is offered to sale without a permit, or by any hawker, pedlar, &c. with a permit, the person to whom it is offered may seize and carry it to the next ware-

house belonging to the customs or excise, and bring the person offering the same before any justice of the peace, to be committed to prison, and prosecuted for the penalties incurred by such offence. The person seizing such goods may prosecute in his own name; and on recovery is entitled to one-third part of the gross produce of the sale; and the commissioners are, if desired, upon a certificate from the justice of the offender's being committed to prison, to advance to the seizer fifteen shillings per gallon for the arack so seized. Arack (except for the use of seamen, two gallons each) found in any ship or vessel arrived from foreign parts, at anchor, or hovering within the limits of any port, or within two leagues of the shore; and not proceeding on her voyage (unless in case of unavoidable necessity and distress of weather, notice thereof must be given to the collector or chief officer of the port upon the ship's arrival), is forfeited with the boxes, casks, or other package, or the value thereof.

Arack, Tungusian, is a spirituous liquor, made by the Tartars of Tungusia, of mare's milk, left to sour, and afterwards distilled twice or thrice between two earthen pots closely stopped, whence the liquor runs through a small wooden pipe. It is more intoxicating than brandy.

ARACTHUS, a river of ancient Epirus, on which Ambrachia was seated, now called Spagmagmurisi.

ARACUS, in botany, wild vetch. See Vicia.

Aracus Aromaticus, in the materia medica, a name given by some authors to the vanilla, used in making chocolate.

ARAD, a king in the south of Canaan. The Israelites having advanced towards the land of Canaan, (Numb. xxi. 1.), Arad opposed their passage, defeated them, and took a great booty from them; but they destroyed this country as soon as they became masters of Canaan.

Arad, in ancient geography, a city of Arabia Petræa, laying south of Judah. Eusebius places it in the neighbourhood of Kades, at the distance of twenty miles from Hebron. In modern geography, a district and town of Hungary.

Arad-Varmegye, a county in Hungary, forty-eight miles long, and from nine to fourteen broad. It is bounded on the south by the river Marosch, which separates it from Temeswar, on the north by the county of Sarand, on the west by Ischanad, and on the east by Transylvania. A great proportion of it is mountainous, woody, and full of game. But the valleys are fruitful, and the sides of the hills are covered with vineyards. The cattle are in good condition. The inhabitants, mostly Wallachians, are taken, with the county of Sarand, at 152,938. In the whole county there are six market towns, and forty-one villages, six Catholic, and forty-two Greek parishes.

Arad, Old, a market town of Hungary, on the Marosch, with a catholic and Greek parish church, the capital of the foregoing county. It was greatly enlarged in 1765. Not far hence is the strong castle of Arad, which gives name to the town and county, but is now in ruins. It is twenty-four miles north of Temeswar, and 195 south-east of Presburg.

Arad, New, on the same river, is two miles and a half distant, and surrounded with fortifications, forming a perfect square, completed in 1776. The inhabitants are, for the most part, Germans; but the two suburbs, at some distance from the town, are peopled by Russians. It is a post town, and does not properly belong to the county of Arad-Varmegye, but to the circle of St. Andrew, in the county of Temeswar. The breeding of cattle and culture of tobacco form the main occupation of the people in the neighbourhood. Long. 21° 3′ E., lat. 46° 11′ N.

ARADOS, a word used by Hippocrates for that perturbation which is excited in the stomach by concocting meats of different qualities. Arados also signifies any internal perturbation caused by purging medicines, vehement exercise, &c.

ARADUS, in ancient geography, an island between Phœnicia and Seleucis, twenty stadia from a dangerous coast. It is a rock surrounded by the sea, in compass seven stadia; and formerly a very powerful city and republic. It is now called Romad; but not a single wall is remaining of all that multitude of houses which, according to Strabo, were built with more stories than even those of Rome. The liberty enjoyed by the inhabitants had rendered it very populous; and was supported by naval commerce, manufactures, and arts. At present the island is deserted; nor has tradition even retained the memory of a spring of fresh water in its environs, which the people of Aradus discovered at the bottom of the sea, and from which they drew water in time of war, by a leaden bell and a leathern pipe fitted to its bottom.

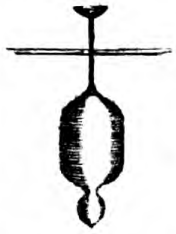
Aradus, in zoology, a genus of insects, of the order hemiptera, family cimicides. Its generic character is antennæ cylindrical, inserted into the sides of the projecting anterior portion of the head. Body much depressed, membranaceous. Head stretched out, elongated at the fore part. Thorax having the margins often eroded or denticulated.

ARÆOMETER, from *αραιος*, thin, and *μετρον*, measure; an instrument wherewith to measure the density or gravity of fluids. The aræometer, or water-poise, is usually made of glass; consisting of a round hollow ball, which terminates in a long slender neck hermetically sealed at top; there being first as much running mercury put into it as will serve to balance or keep it swimming in an erect position. The stem is divided into degrees, and by the depth of its descent into any liquor, the lightness of that liquor is concluded: for that fluid in which it sinks least must be heaviest, and that in which it sinks lowest, lightest. Homberg invented a new aræometer, described in Phil. Transact. No. 262: thus, A is a glass bottle or matrass, with so slender a neck that a drop of water takes up in it about five or six lines, or half of an inch. Near that neck is a small capillary tube D, about six inches long, and parallel to the neck. To fill the vessel, the liquor is poured in at the mouth B (which is widened to receive a funnel), till it runs out at D, that is, till it rises in the neck to the mark C, by which means you have always the same bulk or quantity of liquor; and, consequently, by means of the balance, can easily tell, when different liquors fill it, which weighs

most, or is most intensely heavy. Some regard, however, is to he had in these trials to the season of the year, and degree of heat and cold in the weather; because some liquors rarefy with heat and condense with cold more than others, and accordingly take more or less room. See HYDROMETER. By means of this instrument, which weighs, when empty, one dram twenty-eight grains, the ingenious author has made a table to show the different weights of the same bulk of the most considerable chemical liquors both in summer and winter, as follows:—

	Weighed in summer.				In winter.		
	oz.	dr.	gr.		oz.	dr.	gr.
The araeometer full of Quicksilver.	11	0	6	—	11	0	32
Oil of tartar	1	3	8	—	1	3	31
Spirit of urine	1	0	32	—	1	0	43
Oil of vitriol	1	3	58	—	1	4	3
Spirit of nitre	1	1	40	—	1	1	70
Spirit of salt	1	0	39	—	1	0	47
Aqua fortis	1	1	38	—	1	1	55
Vinegar	0	7	55	—	0	7	60
Spirit of wine	0	6	47	—	0	6	61
River water	0	7	53	—	0	7	57
Distilled water	0	7	50	—	0	7	54

In Fahrenheit's araeometer the uncertainty arising from the erroneous division of the scale is obviated, no division being required. The form of the instrument is similar to that of many others, only at the top there is a small cup into which weights are put, so as to bring the surface of the denser liquid to a fixed mark on the stalk; when the instrument is placed in a liquid of less density, some of the weights are taken out till the mark again comes to the surface. Suppose the weight of the instrument and of the weights in the cup together equal to 1000, when sunk to the mark in distilled water at a certain temperature; the instrument is taken out of the water and immersed in a liquid, where ten must be taken out of the cup in order to bring the mark to the surface; the immersion in water indicates that a volume of water weighs 1000; the immersion in the second liquid shows that an equal volume of this liquid weighs 990; when the volumes of bodies are equal, the specific gravities are directly as the absolute weights $\frac{G}{g} = \frac{W}{w}$, consequently the specific gravity of the second liquid is 990, that of water being 1000. To save computation, it is convenient that the whole weight of the apparatus, when in distilled water, at a certain temperature, should be represented by 1000; for this purpose the instrument-maker divides the weight of the apparatus into 1000 parts, and forms small weights consisting of one, two, three, &c. of these thousandth parts, the relation of which, to the ounce or pound, does not require to be known; the weights thus formed are to be used with the instrument.



The araeometer of Nicholson is like that of Fahrenheit, with the addition of an immersed cup, whereby it is rendered proper for ascertaining the specific gravity of solids. Suppose that it requires 400 grains in the exterior cup to sink the instrument to the mark in distilled water, at sixty degrees of Fahrenheit's thermometer: 1. The body under examination is put into the exterior cup, and weights (say 300 grains) are taken out till the mark again stands at the surface; this gives the absolute weight of the body 300 grains. 2. The body is then put into the immersed cup S, taking care to brush off any air bubbles with a hair pencil, and, in order to bring the mark to the surface, a weight (say 100 grains) must be put into the exterior cup, that is, the weight of a volume of water equal to the body, is 100 grains. The first part of the process gave the absolute weight of the body 300 grains, and, the volumes being equal, the specific gravities are as the absolute weights, consequently the specific gravity of the body is 300, that of water being 100. This araeometer may be used to find the specific gravity of liquids; the process, in that case, is the same as that described above in speaking of the araeometer of Fahrenheit. The araeometer of Nicholson is useful to the mineralogist for ascertaining the specific gravity of minerals; the specific gravity being a convenient character for distinguishing one kind of mineral from another. It is sometimes made of tinned iron, but, where more accuracy is required, copper is the material employed. When put together it does not exceed a foot in length, and therefore is suited to travelling. See HYDROMETER.

ARÆOSTYLE; from *αραιος*, and *στυλος*, a column; in architecture, a term used by Vitruvius to signify the greatest interval between columns.

ARÆOTICS, in medicine, remedies which rarefy the humors, and render them easy to be carried off by the pores of the skin, such as sudorifics, &c.

ARÆPHILÆNON, or ARÆPHILÆNORUM, altars, according to Strabo, south of Syrtis Major, but, according to Peutinger, more westerly, and south almost of the Syrtis Minor. On a dispute about limits between the Cyreneans and Carthaginians, it was agreed that two of each people should set out on the same day, and that where they should happen to meet, there the limits of both should be fixed. The Philæni, two brothers Carthaginians, undertook it for Carthage: these, after having advanced many miles into the territory of the Cyreneans, were met by their antagonists; who, enraged at their being beforehand with them so far, gave them the option of their returning back, or of being buried alive on the spot. Like zealous patriots they chose the latter; and there the Carthaginians raised two altars in honor of the Philæni. In Strabo's time the altars were not extant, but a village of this name stood on the spot.

ARAFAH, the ninth day of the last month of the Arabic year, named Dhoulhegiat; on which

the pilgrims of Mecca perform their devotions on the mountain ARAFAT.

ARAFAT, or GIBEL EL ORPHAT, 'the mountain of knowledge,' or of gratitude, a mountain in Arabia, near Mecca. The Mahommedans say this was the place where Adam first received his wife Eve, after they had been expelled from Paradise, and separated from each other 120 years! On the summit is a chapel ascribed to Adam; the interior of which was rifled by the Wahabees in 1807. This mountain not being large enough to contain all the devotees that come annually on pilgrimage to Mecca, stones are set up all round it to show how far it reaches. The pilgrims are clad in robes of humility and mortification, with their heads uncovered. They seem to be much affected; the tears flow down their cheeks, and they sob and sigh most bitterly, begging for remission of sins, and promising to lead a new life. On the 17th of February, 1807, this ceremony was performed by an assemblage of 80,000 men, 2000 women, and 1000 children; in whose service were employed about 70,000 camels, horses, and asses. The hill and its whole environs, were covered by this vast multitude, of which one portion consisted of 45,000 Wahabees mounted, and almost entirely naked. The pilgrims must approach the foot of the hill to await the setting of the sun; and an evening prayer must also be said an hour and a half afterwards, at a chapel six or seven miles distant, not later than the last moment of twilight. A dreadful noise and tumult ensues as the sun disappears, from such a disorderly assemblage; but accidents seldom happen.

ARAGON (Tullia d'), a poetess of the sixteenth century, descended from an illegitimate branch of the royal family of Spain. Her father, cardinal d'Aragon, placed her first at Ferrara, and afterwards at Rome, where her fine taste received the highest degree of cultivation. Her works are, Rime, in one 8vo. vol. printed in 1547; Dialogo dell' infinita d'Amore, which appeared in the same year; and Il Meschino oil Guerino, 4to. in 1560. Her beauty and accomplishments were the theme of several poets of her age.

ARAGONA, a principality of Italy, in the Val di Mazara, belonging to Sicily.

ARAGUAIA, a large river of Brasil, in the province of Para, which enters the Tocantins.

ARAGUAYA, a river of Brasil, which separates the province of Matto Grosso on the east from that of Goiaz. It has its source in the nineteenth degree of south latitude, and, running north, flows into the great river Tocantins, in the sixth degree of south latitude. Both thus united in one ample stream continue their course for 370 leagues, when they fall into the Amazons in 1° 40′ south latitude, twenty leagues west of the city of Para.

ARAHUM, or HARAHUM, in ancient writers, denotes a place consecrated or set apart for holy purposes. Hence the phrase in araho jurare, or conjurare, 'to make oath in the church;' because, by the Ripuarian laws, all oaths were to be taken in the church, on the relics of the saints.

ARAJA (Francisco), a Neapolitan musician and composer, who entered the service of the empress Catherine of Russia, and produced at St. Petersburg, in 1755, Cephalo et Procris, the first opera ever written in the Russian language. Having amassed property he returned to Italy in 1759, and died at Bologna.

ARAICHE, EL, or LARACHE, a seaport of Morocco, in the province of El Garb, at the mouth of the river El Kos. The surrounding country is fertile and beautiful, producing corn, wax, and oil, as well as timber for ship-building. The river has a bar of sand at its entrance; after passing which, the depth is sufficient to admit vessels of 100 tons. It was formerly a town of considerable trade; and there are still to be seen remains of spacious houses. But in the year 1780 the emperor Seedy Mahommed issued orders for all Europeans to quit the town, and it has ever since remained shut against them. This has a castle and batteries, which are in good condition; inhabitants about 3000.

ARAIRE, a small plough used in Provence and Languedoc, in France.

ARAIS ALNIL, in botany, the name given by the people of Egypt to the faba Egyptia, or heads of the nilufar.

ARAISE'. Ang.-Sax. aresian, to raise. See RAISE.

> Whose simple touch
> Is powerful to *arayse* king Pippen, nay
> To give great Charlemaine a pen in's hand
> And write to her a love line.
>
> *Shakspeare. All's Well that Ends Well.*

ARAL, the largest lake in Asia next to the Caspian, extends from forty-three to forty-seven degrees of north latitude, and fifty-eight to sixty-two east longitude. Its length is from sixty to seventy geographical miles, and breadth, which on the southern is twice as great as on the northern side, not more than thirty; its circumference about 150. Its name signifies 'the Lake of Eagles.' It is separated by a sandy isthmus, from 150 to 200 geographical miles wide, from the Caspian, with which it closely corresponds in character. Around are sandy deserts, and it is only navigable by flat-bottomed boats; and, having no inlets or harbours, it is little used in a commercial view. It is filled with islands, and two large rivers, the Amū (Jaīh'un or Oxus), and Sirr (Jaxartes), discharge their waters into it. It is probably the Lake Oxianes of Ptolemy, and the Oxia Palus of Ammianus Marcellinus, though the ancients commonly supposed the Oxus and Jaxartes to flow into the Caspian. Some have therefore supposed that the Aral did not exist, as a separate body of water, at that period. The saltness of the water, marine productions, and sandy bottom of this and the Caspian are difficult to account for, except on the supposition of their having, in very remote times, formed a part of the Mediterranean. There are still extant strong indications of the ancient junction between this lake and the Caspian, in the narrowest part of the isthmus between them, which does not exceed eighty geographical miles. The same kinds of fish are found in Aral that are found in the Caspian sea. It is called the Lake of Islands by the Tartars.

ARALIA, in ancient law writers, arable lands. They are also denominated aratoria, and aratuaria. In Doomsday for Essex we meet with

decem acras prati, duos runcal. quatuor aralia; where aralia seems to denote land fit for ploughing or tillage, in contradistinction to runcalia, which was overrun with briars and thorns.

ARALIA, in botany, the angelica tree. A genus of the pentagynia order and pentandria class of plants, ranking in the natural method under the forty-sixth order, hederaceæ. The essential characters are: the involucrum is an umbella: CAL. quinquedentated, and above the fruit: COR. five petals; and the berry five seeded There are five species of aralia, all natives of the Indies. The principal are: 1. A. nudicaulis having a stalk. This grows three or four feet high; the leaves have two large trifoliated lobes, which are sawed on their edges: 2. A. spinosa, with a prickly stem, is a very ornamental shrub, and a native of Virginia. The height to which this tree will grow, if the soil and situation wholly agree with it, is about twelve feet. This tree will spawn, as the gardeners denominate it; i. e. after loosening the mould about the roots young plants will arise, the broken roots sending forth fresh stems: nay, if the roots are planted in a warm border, and shaded in hot weather, they will sometimes grow; but if planted in pots, and assisted by a moderate warmth of dung, or tanners' bark, they will be pretty sure of success; so that the propagation of this tree is very easy. But the general method of propagating it, and by which the best plants may be had, is from seeds, which must be procured from America, for they do not ripen in Britain; and, after having obtained them, they must be managed in the following manner: The time that we generally receive them is in the spring; when we must be furnished with a sufficient number of large pots. These must be filled with fine mould, taken from a rich border. The seeds must be sown in these pots as soon as possible after their arrival, hardly half an inch deep, and then the pots should be plunged in a warm place, their whole depth in the soil. Care must be taken to break the mould in the pots, and water them as often as it has a tendency to crust over; and if they are shaded in hot weather, the plants will frequently come up the first summer. But, in any case, the pots should be plunged in a shady place; for they will flourish after that better in the shade; and the design of plunging them in a warm place at first was only with a view of setting the powers of vegetation at work, that, having natural heat, artificial shade also may be given them, and water likewise, the three grand necessaries for the purpose. The pots, whether the plants are come up in them or not, should be removed into shelter in October, either into a green-house, some room, or under a hot-bed frame; and in the spring, when all danger of frost is over, they should be plunged into the natural ground their own depth in a shady place Those that were already come up will have shot strong by the autumn following; and if none of them have appeared, they will come up now. Whether they are young seedlings, or small plants of a former summer's growth, they must be kept clean of weeds, and watered in the time of drought, until autumn. In October they must be again removed, either into a green-house, &c. as before, or fixed in a warm place, and hooped, that they may be covered with mats in frosty weather. In the end of March following, they should be planted in the nursery way, to gain strength before they are finally planted out. The ground for this purpose, besides the natural shelter, should have a reed hedge, or something of the like nature, the more effectually to prevent the piercing winds from destroying the young plants. In this place the plants may be set in rows; in each of which, furze bushes should be stuck the whole length; and all these together will ensure their safety. But here one caution is to be observed; not to stick the furze so thick but that the plants may enjoy the free air in mild weather, and not to take them away too early in spring, lest, being kept warm the whole winter, and being deprived of their protection, a cutting frost should happen, as it sometimes does even in April or May, and destroy them. Weed and water them in dry weather in summer. They may be guarded again with furze bushes in the winter; though it will not be necessary to do it in so close a manner; and with this care, still diminishing in proportion the number of furze bushes, they may continue for three or four years, when they may be planted out into the warmest parts of the plantation. With this management, these plants will be inured to bear our winters in well-sheltered places. The spines which grow on the branches and the leaves admonish us, for our own safety, not to plant this tree too near the sides of walks.

ARALIASTRUM, in botany, ginseng.

ARAM, ארם, i. e. highness, a name pretty common among the patriarchs: e. g. 1. The fifth son of Shem, father of the Aramites, the founder of Aram; 2. the son of Kemuel, and grandson of Nahor, Abraham's brother; and 3. Aram, or Ram, the son of Hezron, and great-grandson of Judah.

ARAM (Eugene), a native of Yorkshire, in England, who, though very scantily educated by his parents, through natural genius and industrious perseverance acquired a considerable knowledge of the mathematics, and of the Latin, Greek, Hebrew, and Chaldee languages. In 1744 he became a teacher of Latin and writing at a school in London, where he continued two years, and afterwards was assistant in a boarding-school at Hayes in Middlesex. Some time after he was employed in transcribing the acts of parliament to be registered in chancery; and in 1757 assisted in the free-school at Lynn. About this time he studied history, antiquity, heraldry, and botany. Besides which, he was no inferior poet. He investigated the Celtic, as far as possible, in all its dialects; and had begun to form collections, and make comparisons between the Celtic, English, Latin, Greek, and Hebrew, and to form a Comparative Lexicon. But in the midst of these learned and laborious enquiries he was, in 1758, apprehended at Lynn for murdering one Daniel Clarke, thirteen years before, and carried to York castle. At his trial, in August 1759, he made a very able defence, but was found guilty, and next morning confessed the crime, which he ascribed to his jealousy of Clarke. When his irons were taken off, his arm was found cut in

two places with a razor; and he was taken thus to the gallows at York, and hanged.

ARAM, or the ARAMÆAN REGION, in ancient geography, the Hebrew name of Syria, so called from the son of Shem. Nor was this name of ancient Syria confined to the Hebrews, for it is remarkable that Hesiod and Homer, two of the most ancient Greek authors extant, call the Syrians, Aramæans. Aram accordingly made a part of several divisions of ancient Syria: such as,

1. ARAM BETH-REHOB, that part of Syria which lay to the north of Palestine; because Rehob was its boundary towards that quarter. It was allotted to the tribe of Asher, where it joins Sidon.

2. ARAM-DAMMESEK, or Syria Damascena, a principal part of Syria, which took its name from Damascus, the principal city.

3. ARAM-MAACHA, a district of Syria, at the foot of Mount Hermon, on the borders of the half tribe of Manasseh, on the other side of the Jordan, called the coast of Maachathi.

4. ARAM-NAHARAIM, i. e. Aram, or Syria of the Rivers, or Mesopotamia, situated between the Euphrates and Tigris; whence the name.

5. ARAM-SOBA, or ARAM-ZOBAH, the country which David conquered, was situated where Palmyra afterwards stood. The Euphrates bounded it on the east, Canaan and Syria Damascena on the west.

ARAMÆANS, or ARAMITES, the ancient inhabitants of Syria. See ARAM.

ARAMONT, a town of France, in the department of Garde, seated on the Rhone, five miles west of Avignon, and twenty south-east of Uzes. Lon. 5° 0′ E, lat. 43° 54′ N.

ARAMPO, or MAN-EATER; in zoology, a name given by the negroes on the African coast, to a long slender animal, shaped somewhat like a weasel. It has a long tail bushy at the end. It gets its name from digging up graves and feeding on human flesh.

ARAN, a valley among the Pyrenean mountains, which is crossed by the river Garonne, before it enters the Comines.

ARANDA DE DUERO, a town on the Duero, or Douro, in Spain, in the province of Burgos, on the great road from Burgos to Madrid; thirty-five miles south of the former place, and ninety north of the latter. It is fortified, has two parish churches, a collegiate church, four religious houses, and 3500 inhabitants. Corn and wine are raised in the vicinity.

ARANEA, in entomology, the SPIDER; a genus of insects belonging to the order of aptera, or insects without wings. Most of the known species have eight legs, with three joints in each, and terminating in three crooked claws: eight eyes; two before, two behind, and the rest on the sides of the head; but some few have only six eyes. In the forepart of the head, at the mouth, there is a pair of sharp crooked claws or forceps: these stand horizontally; and, when not exerted for use, are concealed in two cases contrived for their reception, in which they fold like a clasp-knife, and there lie between two rows of teeth. A little below the point of each claw there is a small hole, through which Leuwenhoek supposes the spider emits a kind of poison. But Dr. Mead, in his Essay on Poisons, dissents wholly from this opinion, having never been able, on repeated examination, to discover any such opening, not even in the claws of the largest foreign spider; which, being above fifty times bigger than any of the European spiders, would more easily have afforded a view of this opening, if nature had allotted any to this part of the animal. Repeated observation also convinced him that nothing dropped out of the claws, which were always dry while the spider bit any thing, but that a short white proboscis was at the same instant thrust out of the mouth, which instilled a liquor into the wound. And the same author observes, that the quantity of liquor emitted by our common spiders, when they kill their prey, is visibly so great, and the wounding weapons so minute, that they could contain but a very inconsiderable portion thereof, if it were to be discharged that way. These claws are the weapons with which they kill flies, &c. for their food. The belly or hinder part is separated from the head and breast by a small thread-like tube. The skin or outer surface is a hard polished crust. Spiders frequently cast their skins, which may be found in the webs perfectly dry and transparent; and from such skins the forceps, or claws, for they are always shed with the skins, may easier be separated, and examined with much greater exactness, than in the common spider while living. Spiders have five tubercles or nipples at the extremity of the belly, whose apertures they can enlarge or contract at pleasure. It is through these that they spin a gluey substance, of which their bellies are full. They fix the end of their threads by applying these nipples to any substance, and the thread lengthens in proportion as the animal recedes from it. They can stop the issuing of the threads by contracting the nipples, and re-ascend by means of the claws of their feet, much in the same manner as some men warp up a rope. When the common house-spider begins her web, she generally chooses a place where there is a cavity, such as the corner of a room, that she may have a free passage on each side, to make her escape in case of danger. Then she fixes one end of her thread to the wall, and passes on to the other side, dragging the thread along with her (or rather the thread follows her as she proceeds), till she arrives at the other side, and there fixes the other end of it. Thus she passes and repasses, till she has made as many parallel threads as she thinks necessary for her purpose. After this, she begins again and crosses these by other parallel threads, which may be named the woof. These are the toils or snares which she prepares for entangling flies, and other small insects which happen to light upon it. She also generally weaves a small cell for herself, where she lies concealed watching for her prey. Betwixt this cell and the large web she has a bridge of threads, which, by communicating with the threads of the large one, both gives her early intelligence when any thing touches the web, and enables her to pass quickly in order to lay hold of it. There are many other methods of weaving peculiar to different species of spiders, all intended for the same purpose.

The darting out of long threads, which has

been observed by the naturalists, and by means of which some species of spiders can convey themselves to great distances, deserves particular notice. Dr. Lister tells us, that attending closely to a spider weaving a net, he observed it suddenly to desist; and turning its tail to the wind, it darted out a thread with the violence and stream we see water spout out of a jet: this thread, taken up by the wind, was immediately carried to some fathoms long; still issuing out of the belly of the animal. By-and-by the spider leaped into the air, and the thread mounted her up swiftly. He made the like observation on near thirty different species of spiders; and found the air filled with young and old, sailing on their threads, and doubtless seizing gnats and other insects in their passage, there being often manifest signs of slaughter, legs and wings of flies, &c. on these threads, as well as in their webs below. Dr. Hulse remarked the same thing at about the same period. Dr. Lister thinks there is a hint of the darting of spiders in Aristotle, (Hist. An. lib. ix. cap. 39; and in Pliny, lib. x. cap. 74.) But with regard to their sailing, the ancients are silent, and he thinks it was first seen by him. He also observes of those sailing spiders, that they will often dart, not a single thread only, but 'a whole sheaf at once, consisting of many filaments; yet all of one length, all divided each from the other, and distinct until some chance either snap them off or enlarge them. But for the most part the longer they grow, the more they spread, and appear to a diligent observer like the numerous rays in the tail of a blazing star. As for that which carries them away in the air, so swift offhand, it is partly their sudden leap; partly the length and number of the threads projected, the stream of the air and wind beating more forcibly upon them, and partly the posture and management of their feet, which, at least by some sort of them, I have observed to have been used very like wings or oars, the several legs, like our fingers, being sometimes close joined, at other times opened, again bent, extended, &c. according to the several necessities and will of the sailor. To fly they cannot be strictly said, they being carried into the air by external force; but they can, in case the wind suffer them, steer their course, and perhaps mount and descend at pleasure: and for the purpose of rowing themselves along the air, it is observable that they ever take their flight backwards; that is, their head looking a contrary way, like a sculler upon the Thames. It is scarcely credible to what height they will mount; which yet is precisely true, and a thing easily to be observed by one that will fix his eye some time on any part of the heavens, the white webs, at a vast distance, very distinctly appearing from the azure sky; but this is in autumn only, and that in very fair and calm weather.' In a letter to Mr. Ray, he further observes, 'Last October, &c. I took notice that the air was very full of webs; I forthwith mounted to the top of the highest steeple on the Minster, (in York,) and could there discern them yet exceeding high above me.' He then saw, that they not only thus shoot their threads upward, and mount with it in a line almost perpendicular; but also project them in a fine parallel to the horizon, as may be seen by their threads running from one wall to another in a house, or from one tree to another in the field, and even from wall to wall across gardens of considerable extent. The matter of which the threads are formed, is a viscid juice, elaborated in the body of the animal, and emitted from papillæ situated at the extremity of the belly; which are furnished with numerous apertures that do the business of wire-drawers, as it were, in forming the threads. Of these apertures, M. Reaumur observes, there are enough in the compass of the smallest pin's head to yield a prodigious quantity of distinct threads. M. Reaumur has often counted seventy or eighty with a microscope; but has perceived that there were infinitely more than he could tell. In effect, if he should say that each tip of a papilla furnished a thousand, he is persuaded he should say far too little. The part is divided into an infinity of little prominences, like the eyes of a butterfly, &c. Each prominence no doubt makes its several threads; or rather between the several protuberances there are holes that give vent to threads; the use of the protuberances, in all probability, being to keep the threads at their first exit, before they are yet hardened by the air, asunder. In some spiders those protuberances are not so sensible; but in lieu thereof there are tufts of hair which may serve the same office, viz. to keep the threads apart. Be this as it will, there may threads come out at above a thousand different places in every papilla; consequently the spider, having five papillæ, has holes for above five thousand threads. Such is the tenuity of the threads in the larger sort of spiders. But if we examine the young produced by those, we shall find that they no sooner quit their egg than they begin to spin. Indeed their threads can scarcely be perceived, but the webs may: they are frequently as thick and close as those of house spiders; and no wonder, there being often 400 or 500 little spiders concurring to the same work. How minute must their holes be; the imagination can scarce conceive that of their papillæ! The whole spider is perhaps less than a papilla of the parent which produced it. But there are even some kinds of spiders so small at their birth, that they are not visible without a microscope. There are usually found an infinity of these in a cluster, and they only appear like a number of red points: and yet there are webs found under them, though well nigh imperceptible. What must be the tenuity of one of these threads! Mr. Leuwenhoek has computed that 100 of the single threads of a full-grown spider are not equal to the diameter of the hair of his beard; and consequently, if the threads and hair be both round, ten thousand such threads are not bigger than such a hair. He calculates farther, that when young spiders first begin to spin, 400 of them are not larger than one of a full growth; allowing which, 4,000,000 of a young spider's threads are not so big as the single hair of a man's beard.

The generation of spiders varies in different species. As these insects prey upon each other, except during the time of their amours, they dare not come within reach of one another but with the utmost caution. They may sometimes be seen stretching out their legs, shaking the web,

and tampering with each other by a slight touch with the extremity of their feet; then, in a fright, dropping hastily down their thread, and returning in a few moments to make fresh trial by feeling; when once they are well assured of each others sex, the approaches of the feet, in order to feel, become more frequent, confidence takes place, and amorous dalliance ensues. 'We cannot,' says Lyonnet, 'but admire how careful they are not to give themselves up blindly to passion, or venture on an imprudent step which might become fatal to them.' Lister and Lyonnet, two accurate observers, say, that the extremity of those arms or claws, which the male spider uses to grasp his prey with, suddenly opens, as it were by a spring, and emits a white semen. Spiders frequently change their color, which varies much in respect of season, sex, age, &c.; but they are in general more beautifully variegated in autumn; a season not only most opportune and plentiful respecting their prey, but the time when they arrive at their greatest magnitude, and are in their height of vigor.

Garden spiders, particularly the short-legged species, yield a kind of silk, which has by some been judged scarcely inferior to that of the silk-worm. M. Bon of Languedoc, about eighty years ago, contrived to manufacture from it a pair of silk stockings and mittens, of a beautiful gray color, which were almost as handsome and strong as those of silk; and he published a dissertation concerning the discovery. But M. Reaumur, being appointed by the Royal Academy, to make a farther enquiry into this new silk work, raised several difficulties and objections against it, which are found in the Memoirs of the Academy for the year 1710. The sum of what he has urged amounts to this: the natural fierceness of the spider renders them unfit to be kept together. Four or five thousand being distributed into cells, fifty in some, one or two hundreds in others, the big ones soon killed and eat the less, that in a short time there were scarce left one or two in each cell; and to this inclination of actually eating one another M. Reaumur ascribes the scarcity of spiders, considering the vast number of eggs they lay. But this is not all; he even affirms that the spider's bag is inferior to that of the silk-worm both in lustre and strength, and that it produces less matter to be manufactured. The thread of the spider's web, he says, only bears a weight of two grains without breaking; and that of the bag bears thirty-two. The latter, therefore, in all probability, is fifteen times thicker than the former; yet it is thinner than that of the silk-worm, which bears a weight of two drams and a half. So that five hundreds of the spider's bag must be put together to equal one thread of the silk-worm's bag. Now it is impossible these should be applied so exactly over one another as not to leave little vacant spaces between them, whence the light will be reflected; and of consequence, a thread thus compounded, must fall short of the lustre of a solid thread. Add to this, that the spider's thread cannot be wound off as that of the silk-worm may, but must of necessity be carded; by which means being torn in pieces, its evenness, which contributes much to its lustre, is destroyed. In effect, this want of lustre was taken notice of by M. de la Hire, when the stockings were presented to the academy. Again, spiders furnish much less silk than the worms: the largest bags of these latter weigh four grains, the smaller three grains; so that 2304 worms produce a pound of silk. The spider's bags do not weigh above one grain; yet, when cleared of their dust and filth, they lose two-thirds of their weight. The work of twelve spiders, therefore, only equals that of one silk-worm; and a pound of silk will require at least 27,648 spiders. But as the bags are wholly the work of the females, who spin them to deposit their eggs in, the number must be doubled. Yet will this only hold of the best spiders; those large ones ordinarily seen in gardens, &c., scarce yielding a twelfth part of the silk of others; 280 of these, he shows, would not yield more than one silk-worm; 663,552 of them would scarce yield a pound.

The species of aranea enumerated by naturalists amount to upwards of fifty; of which it may here suffice to mention a few of the most remarkable. 1. A. aquatica, or the water-spider, of a livid color, with an oval belly, a transverse line, and two hollowed points. It frequents the fresh waters of Europe. But it is in some sort amphibious. 2. A. avicularia, has a convex round breast, hollowed transversely in the middle. It is a native of America, and feeds upon small birds, insects, &c. The bite of this spider is as venomous as that of the serpent. 3. A. calycina, with a round, pale, yellow belly, and two hollow points. It lives in the cups of flowers, after the flower leaves have fallen off; and catches bees, and other flies, when they are in search of honey. 4. A. cucurbitina, has a globular yellow belly, with a few black spots. It makes its abode among the leaves of trees, and encloses its eggs in a soft nest. 5. A. diadema, the largest spider which this country produces. The abdomen is of an oval form, downy, and of a ruddy yellow color, which is very variable in different seasons; being sometimes pale, at others very dark colored. The upper part is beautifully adorned with black and white circles and dots, having a longitudinal band in the middle, composed of oblong and oval-shaped pearl-colored spots, so arranged as to resemble a fillet, similar to those worn by the eastern kings. The ground upon which this fillet and the white dots are laid, when viewed with a glass, and the sun shining thereon, is beautiful and rich beyond all description. There are varieties of color of this spider when young; some have their abdomen purple, ornamented with white dots, the legs yellow and annulated with a deeper color; others have their abdomen of a fine red, likewise ornamented with white, but their legs of a fine pale green color, annulated with dark purple or black. It inhabits the birch tree. 6. A. fasciata, with yellow bands round the belly, and dusky rings on the legs, a native of Barbary, and as large as the thumb. 7. A. fimbriana, has a black oblong belly, with a white line on each side, and dusky colored legs. It lives in water, upon the surface of which it runs with great swiftness. 8. A. holobericia, has an ovalish belly covered with a down like velvet; at the base or under part,

it has two yellow spots. It is found in the folded leaves of plants. 9. A. labyrinthica, with a dusky oval belly, a whitish indented line, and a forked anus. The web of this species is horizontal, with a cylindrical well or tube in the middle. 10. A. ocellata has three pair of eyes on its thighs. It is about the same size with the tarantula, of a pale color, with a black ring round the belly, and two large black spots on the sides of the breast. It is a native of China. 11. A. saccata has an oval belly, of a dusky iron color. It lives in the ground and carries a sack with its eggs wherever it goes. This sack it glues to its belly, and will rather die than leave it behind. 12. A. tarantula has the breast and belly of an ash color; the legs are likewise ash-colored, with blackish rings on the under part; the fangs or nippers are red on the inner side, the rest being blackish. Two of its eyes are larger than the other, red, and placed in the front; four other eyes are placed in a transverse direction towards the mouth; the other two are nearer the back; it has two antennæ or feelers. It is a native of Italy, Cyprus, Barbary, and the East Indies. It lives in bare fields, where the lands are fallow, but not very hard; and, from its antipathy to damp and shade, chooses for its residence the rising part of the ground facing the east. Its dwelling is about four inches deep, and half an inch wide; at the bottom it is curved, and there the insect sits in wet weather, and cuts its way out if water gains upon it. It weaves a net at the mouth of the hole. These spiders do not live quite a year. In July they shed their skin, and proceed to propagation; which, from a mutual distrust, as they frequently devour one another, is a work undertaken with great circumspection. They lay about 730 eggs, which are hatched in the spring; but the parent does not live to see her progeny, as she expires early in the winter. The ichneumon fly is their formidable enemy.

The bite of the tarantula is said to occasion an inflammation in the part, which in a few hours brings on sickness, difficulty of breathing, and universal faintness. The person is afterwards afflicted with delirium, and sometimes is seized with a deep melancholy. The same symptoms return annually, in some cases, for several years, and at last terminate in death. Music, it has been pretended, is the only cure. A musician is brought, who tries a variety of airs, till at last he hits upon one that urges him to dance; the violence of which exercise produces a proportionable agitation of the vital spirits, attended with a consequent degree of perspiration, the certain consequence of which is a cure. Such are the circumstances that have been generally related, and long credited, concerning the bite of this animal. Kircherus, in his Musurgia, gives a very particular account of the symptoms and cure, illustrated by histories of cases. Among these he mentions a girl who, being bitten by this insect, could be cured only by the music of a drum; and relates, that a certain Spaniard, trusting to the efficacy of music in the cure of the frenzy occasioned by the bite of the tarantula, submitted to be bitten on the hand by two of these creatures, of different colors and possessed of different qualities. The venom was no sooner diffused about his body, than the symptoms of the disorder began to appear; upon which, harpers, pipers, and other musicians were sent for, who by various kinds of music endeavoured to rouse him from that stupor into which he was fallen; but here it was observed that the bites of the two insects had produced contrary effects; for by one he was incited to dance, and by the other he was restrained therefrom; and in this conflict of nature the patient expired. The same account is given in his Phonurgia Nova, with the addition of a cut representing the insect in two positions, the patient in the action of dancing, together with the musical notes of the tune or air, by which, in one instance, the cure was effected. Other writers have averred equally wonderful things of this spider. The honorable Robert Boyle, in his Treatise of Languid and Unheeded Motions, speaking of the bite of the tarantula, and the cure of the disease which follows it, by means of music, says, that having himself had some doubts about the matter, he was, after strict enquiry, convinced that the relations in the main were true; and Dr. Mead, in his Mechanical Account of Poisons, has given an essay on the tarantula, containing the substance of the above relations, which he endeavours to confirm by his own reasoning.

In the Philosophical Transactions for 1672, p. 406, is an extract from Dr. Thomas Cornelio, a Neapolitan physician, to J. Doddington, Esq., his majesty's resident at Venice, communicated by the latter, in which, speaking of his intention to send to Mr. Doddington some tarantulas, he says, 'Meanwhile I shall not omit to impart to you what was related to me a few days since by a judicious and unprejudicate person; which is, that being in the country of Otranto, where those insects are in great numbers, there was a man who thinking himself stung by a tarantula, showed in his neck a small speck, about which in a very short time there arose some pimples full of a serous humor; and that, in a very few hours after, the poor man was sorely afflicted with very violent symptoms, as syncopes, very great agitations, giddiness of the head, and vomiting: but that without any inclination at all to dance, and without a desire of having any musical instruments, he miserably died within two days. The same person affirmed to me, that all those that think themselves bitten by tarantulas, except such as for evil ends feign themselves to be so are for the most part young wanton girls, whom the Italian writers call Dolce di Sale; who, by some particular indisposition, falling into the melancholy madness, persuade themselves, according to the vulgar prejudice, to have been stung by a tarantula.' Serao, an Italian physician, has written an ingenious book, in which he has effectually exploded this opinion as a popular error: and in the Philosophical Transactions No. lx., for the year 1770, p. 236, is a letter from Dominico Cirillo, M. D., professor of nature history in the university of Naples, wherein taking notice of Serao's book, he says, that having had an opportunity of examining the effects of this animal in the province of Taranto, where it is found in great abundance, he finds that

surprising cure of the bite of the tarantula by music, has not the least truth in it; and that it is only an invention of the people, who want to get a little money by dancing when they say the tarantism begins. He adds, 'I make no doubt but sometimes the heat of the climate contributes very much to warm their imaginations, and throw them into a delirium, which may in some measure be cured by music; but several experiments have been tried with the tarantula, and neither men nor animals after the bite have had any other complaints, than a very trifling inflammation upon the part, like that produced by the bite of a scorpion, which goes off by itself without any danger at all. In Sicily, where the summer is still warmer than in any part of the kingdom of Naples, the tarantula is never dangerous; and music is never employed for the cure of the pretended tarantism.' Mr. Swinburn, when in the country of the tarantula, was desirous of investigating minutely every particular relative to that insect; but the season was not far enough advanced, and no tarantati (persons bitten or pretending to be bitten by the tarantula) had begun to stir. He prevailed, however, upon a woman who had formerly been bitten, to act the part, and dance the tarantata before him. A great many musicians were summoned, and she performed the dance, as all present assured him, to perfection At first she lolled stupidly on a chair, while the instruments were playing some dull music. They touched, at length, the chord supposed to vibrate to her heart; and she sprung up with a most hideous yell, staggered about the room like a drunken person, holding a handkerchief in both hands, raising them alternately, and moving in very true time. As the music grew brisker her motions quickened, and she skipped about with great vigor and variety of steps, every now and then shrieking very loud. The scene was far from pleasant; and, at his desire, an end was put to it before the woman was tired. Wherever the tarantati are to dance, he informs us a place is prepared for them, hung round with bunches of grapes and ribands. The patients are dressed in white, with red, green, or yellow ribands, for those are their favorite colors; on their shoulders they cast a white scarf, let their hair fall loose about their ears, and throw their heads as far back as they can bear it. They are exact copies of the ancient priestesses of Bacchus. The orgies of that god, whose worship under various symbols was more widely spread over the globe than that of any other divinity, were no doubt performed with energy and enthusiasm by the lively inhabitants of this warm climate. The introduction of Christianity abolished all public exhibitions of these heathenish rites; and the women durst no longer act a frantic part in the character of Bacchantes. Unwilling to give up so darling an amusement, they devised other pretences; and accident may have led them to a discovery of the tarantula. Upon the strength of its poison, the Puglian dames still enjoy their old dance, though time has effaced the memory of its ancient name and institution: and this Mr. Swinburn takes to be the origin of so strange a practice. If at any time these dancers are really and involuntarily affected, he supposes it can be nothing more than an attack upon their nerves, a species of St. Vitus's dance; and he inclines the more to the idea, as there are numberless churches and places throughout these provinces dedicated to that saint. Many sensible people of the country, however, differ in opinion from Dr. Serao and other authors, who have ridiculed the pretended disorder, and affirm that the venom of this species of spider can produce no effects but such as are common to all others. The Brindisians say, that the tarantulas sent to Naples for the experiment, were not of the true sort, but a much larger and a more innocent one; and that the length of the journey, and want of food, had weakened their power so much as to suffer the doctor or others to put their arm into the bag where they were kept with impunity. They quote many examples of persons bitten as they slept out in the fields during the hot months, who grew languid, stupid, deprived of all courage and elasticity, till the sound of some favorite tune roused them to dance, and throw off the poison. These arguments, however, Mr. Swinburn thinks of little weight; for they acknowledge that elderly persons were more frequently affected than young ones; and that most of them were women, and those unmarried. No person above the lowest rank in life was ever seized with this malady, nor is there an instance of its causing death. The length of the dance, and the patient's powers of bearing such excessive fatigue in the canicular season, prove nothing; because, every day at that time of the year, peasants may be seen dancing with equal spirit and perseverance, though they do not pretend to be seized with the tarantism. The illness may therefore be attributed to hysterics, excessive heat, stoppage of perspiration, and other effects of sleeping out of doors in a hot summer air, which is always extremely dangerous, if not mortal, in most parts of Italy. Violent exercise may have been found to be a certain cure for this disorder, and continued by tradition, though the date and circumstances of this discovery have been long buried in oblivion; a natural passion for dancing, imitation, custom of the country, and a desire of raising contributions upon the spectators, are probably the real motives that inspire the tarantati. Before Serao's experiments, the tarantula had been proved to be harmless, from trials made in 1693 by Clarrizio, and in 1740 at Lucera by other naturalists.

Gmelin has enumerated more than 120 species of this genus, which are separated into distinct sections, according to the number and position of their eyes.

A. Eyes placed ::::

B. Eyes ·::::·

C. Eyes . ⁘ ⁘ .

D. Eyes .:::.

E. Eyes ·.::..

F. Eyes ::
⁘ ⁘

G. Eyes : :
....

H. Eyes ⁘

I. Eyes ⁘

K. Eyes ⁘

L. Eyes ⁘

M. Eyes ⁘

N. Eyes ⁘

O. Eyes ⁘

P. Eyes, number and position unknown.

ARANEA, in mineralogy, a silver ore found only in the mines of Potosi, or in the single mine there of Catamito. It owes its name to some resemblance it bears to a cobweb, being composed of threads of pure silver, which appear like a silver lace, when burned to separate the silk from it. It is the richest of all kinds of silver ore.

ARANEA CONCHA, in natural history, the name of a kind of sea-shell, of which there are several species: we call them in English the spiders' shells: they are of the family of the murex, and their peculiar character is the having digitated lips. The several species have different numbers of fingers, from the lip of the shell, as four, five, six, seven, or eight.

ARANEA TUNICA. See ARACHNOIDES.

ARANEIFORMIS, in entomology, a species of cerambyx which inhabits South America.

ARANEIFORMIS, in natural history, a species of echinus. It is echinometra multipes s. spinosissima Americana of Seba; and spinnekopf. Phels. Zee-egel. It inhabits the American seas.

ARANEUS, in medicine, a low pulse, according to Galen. The word is used by Hippocrates for a flaky urine, having films like cobwebs in it.

ARANEUS MARINUS, the sea spider, a name by which some have called the fish more usually known by the name of draco marinus, and supposed to have something venomous in the spines of its back fin.

ARANJUEZ, a town and palace of the kings of Spain, situated on an island formed by the Tagus, the Xarama, and a canal, in the province of Toledo, 6½ Spanish leagues from Madrid. The town of Aranjuez was first indebted for its enlargement to Ferdinand VI. It is built in the Dutch style, having broad parallel streets, with fine pavements, and the intersections at right angles. The houses are two stories high, painted white, with green doors and window-shutters, and having generally double rows of trees before them. The principal in the great square are the church, a Franciscan monastery, and covered market-place. The inhabitants derive handsome incomes from the residence of the court. The high road from Aranjuez to Madrid is said to have cost three millions of reals (£33,250 sterling). It was begun under Ferdinand VI. Population of the town, during the residence of the court about 10,000. The country around is one of the most delightful in Spain. The ground of the palace was appropriated by Charles I. and the foundation laid by his son Philip II. Succeeding monarchs, in particular Ferdinand VI. and Charles II. contributed their share to its enlargement and embellishment; and it contains an excellent collection of paintings, of ancient and modern busts, marble staircases, superb mirrors from the manufactory of St. Ildefonzo, and an apartment filled with beautiful specimens of porcelain from the works at Madrid. But these are exceeded in interest by the gardens, which are in the form of a star, and excite the admiration of every observer. The elm-tree alleys are particularly fine, being so wide that four carriages can go abreast, while between each double row there flows a small canal. The main alley is between 600 and 700 paces long, and twelve feet broad, and is enclosed with a lofty hedge. At every seventy or eighty paces are resting places in the form of squares or hexagons, while fountains and jets d'eau play beautifully in every corner. The water is brought by an aqueduct from the small lake called Mar de Ontigola about a mile distant. Near this is the village of Ontigola, the usual residence of foreign ministers when the court is at Aranjuez. The common practice is for the court to move hither a little after Easter, and to remain till the end of June.

ARANYOS GYERES, a market town of Transylvania, on the river Aranyos, with a reformed church. It is the head-quarters of the frontier cavalry of the Austrians.

ARANYOS, GREAT AND LITTLE, two rivers in Transylvania. The first rises near Clausenburg, the other not far from Offenbanya, and after uniting their streams at St. Kirali, they flow into the Marosch, above St. Emmerick. The beds of these rivers yield particles of gold, which are extracted by the gipsies; hence they are frequently called the golden aranyos.

ARAPABACA, a name given by Plumier to the spigelia of Linnæus, or worm grass.

ARAQUI, in geography, a river of Georgia next in importance to the Cyrus, or Kur, which rising near the gates of Caucasus, flows to the south, and after dividing into two equal parts the southern range of mount Caucasus, falls into the Kur, at the town of Tsgette, twenty five miles above Teflis.

ARAR, or ARARIS, in ancient geography, a river of Celtic Gaul, which rises out of mount Vogesus, on the confines of Lorraine, runs through the Franche Comte and Burgundy, and falls into the Rhone below Lyons. It is so incredibly slow, that the eye cannot distinguish which way it moves, (Cæsar); and therefore Pliny calls it the Sluggish River. Ammianus calls it Sancona which has since been changed to Saone. It runs from north to south. It is famous for a bridge of Cæsar, which was built by the soldiers in one day. It is navigable equally with the Rhone. Its gentleness is thus celebrated.

Rhodani qui gurgite gaudent
Quorum serpit Arar per rura pigerrimus amnis.
Sil. Ital. lib. xv, v. 3

quà Rhodanus raptum velocibus undis
In mare fert Ararim. *Luc.* lib. i. v. 4

ARARAT, אררט, in ancient geography, the mountain on which Noah's ark rested after the abatement of the waters of the universal deluge. Concerning this mountain there are various conjectures; though it is almost universally allowed to be in Armenia Major. Some are of opinion that it is one of the mountains which divide Armenia on the south from Mesopotamia and that part of Assyria inhabited by the Curds; from whom these mountains took the name of Curdu or Cardu, by the Greeks turned into Gordyæi, &c. Others, that it lies towards the middle of Armenia, near the river Araxes, above 280 miles distant from the above-mentioned mountains, making it belong to mount Taurus; but the Armenians are positive that Noah's Ararat is no other than a mountain to which they now give the name of Masis, which lies about twelve leagues to the east of Erivan, and four leagues from the Aras. It is encompassed by several petty hills; on the tops of which are found many ruins, the buildings of the first men, who were afraid to descend into the plains. It stands by itself, in form of a sugar-loaf, in the midst of a very large plain, detached, as it were, from the other mountains of Armenia, which make a long chain; and consists, properly speaking, of two hills; the higher, on which it is said the ark rested, lying to the north-west, and rising far above the neighbouring mountains. The most distinct account we have of this mountain is that given by Mr. Tournefort; who tells us, that this mountain is one of the most disagreeable sights upon earth, without either houses, convents, trees, or shrubs; and seems as if continually wasting and mouldering away. Struys, a Dutch writer, went five days journey up mount Ararat, to see a Romish hermit; passed through three regions of clouds; the first dark and thick, the next cold and full of snow, and the third colder still: he says he advanced five miles every day; and when he came to the place where the hermit had his cell, breathed a very serene and temperate air. He farther states, that the hermit gave him a cross made out of the wood of the ark, with a certificate of its authenticity.

ARARAUNA, in ornithology, the name of a Brasilian bird of the macaw kind: a species of psittacus.

ARAS, or ARAXES. See ARAXIS.

ARASCHA, a rapid river of Mingrelia, which has its source near the village of Kemme, and unites on the borders of the Iberian lordship of Schilio with the Hippus, which rises in the highest mountain of the Soani not far from the source of the Phasis, flows through Letsghumi, divides Mingrelia from Iberia, and enters the Phasis near the Tredia.

ARSASIE, a town of Italy, in the territory of Genoa, but belonging to Piedmont. It is populous and has a good harbour, where it is common for travellers to hire vessels for different ports of Italy. Five miles south-west of Albenga.

ARATEIA, in antiquity, a yearly festival celebrated at Sicyon on the birth-day of Aratus wherein divers honors were paid by a priest consecrated to this service, who for distinction's sake wore a riband bespangled with white and purple spots. It was solemnised with much pomp of music, the choristers of Bacchus attending.

ARATHAPESCOW INDIANS, a nation in North America, who carry on constant wars with the western Dog-ribbed Indians.

ARATICU, a river of the province of Para, in Brasil, which runs north between the Jacunda and Tocantins, and flows into the Amazons at its mouth.

ARATO-BAFABEN, a fixed star of the second magnitude in the head of the dragon.

ARATUM TERRÆ, in our ancient law books as much land as can be yearly tilled with one plough.—Hoc manerium est triginta aratorum.

ARATARA, a river of South America, which has its source in the mountains of Itamaca, and discharges itself into the sea on the south bank of the great river Orinoco. Its mouth is narrow, but it is navigable about ten leagues, and on its banks are found great quantities of fine woods.

ARATURA TERRÆ, ancient service which the tenant was to do his lord by ploughing his land.

ARATUS, a celebrated Greek poet, born at Soli in Cilicia. He flourished about the 124th or 126th Olympiad, in the reign of Ptolemy Philadelphus king of Egypt; and discovered in his youth a remarkable poignancy of wit, and capacity for improvement. Having received his education under Dionysius Heracleotes, a Stoic philosopher, he espoused the principles of that sect. Aratus was physician to Antigonus Gonatas king of Macedon, who admitted him to great intimacy. The poem, Phænomena, of Aratus, which is still extant, gives him a title to the character of an astronomer as well as a poet. In this place he describes the nature and motion of the stars, and shows the particular influences of the celestial bodies. It was translated into Latin by Cicero. There is also a translation by Germanicus Cæsar, and another by Festus Avienus. A quarto edition of the Phænomena was published by Grotius at Leyden, in 1600, in Greek and Latin, with the fragments of Cicero's and the two last-named versions. He was certainly much esteemed by the ancients, since we find so great a number of commentators upon him. Several other works are also ascribed to Aratus. Suidas mentions hymns to Pan; Astrology and Astrothesy; a composition of Antidotes; an Επιθυτικον on Theopropus; an Ηθοποια on Antigonus; an Epigram on Phila, the daughter of Antipater, and wife of Antigonus; an Epicedium of Cleombrotus; a Correction of the Odyssey; and some Epistles in prose. Virgil in his Georgics has imitated or translated many passages from this author; and St. Paul quoted a passage from Aratus in his speech to the Athenians, Acts xvii. 28. wherein he told them, that some of their own poets have said Τω γαρ και γενος εσμεν; 'For we are also his offspring.' These words are the beginning of the fifth line of Aratus's Phænomena.

ARATUS, a famous general of the Achæans, who at twenty years of age commenced the attempt to deliver Greece from its tyrants, and establish one general republic among the different states. He began by expelling Nicocles the

tyrant of his native country, Sicyon; which he thereby joined to the Achæan league, A. A. C 253. Two years afterwards he took the fort of Acrocorinthus, and delivered Corinth from the Macedonian yoke. Being afterwards repeatedly elected prætor, or general of the leagues, he delivered Argos and several other Grecian states from their tyrants. But in the midst of this successful career, while the league was flourishing throughout all Peloponnesus, it was deserted by the Lacedæmonians, whose king, Cleomenes III. joined the Ætolians and defeated Aratus; A. A. C. 235. By the advice of Aratus the Achæans called in the assistance of Antigonus II. king of Macedonia, who joined the league and defeated Cleomenes: but Aratus was afterwards poisoned by his ungrateful successor Philip VI. whom he had newly restored, in the second year of the 141st Olympiad, and the sixty-second of his age. He was interred at Sicyon, and received the greatest honors from his countrymen. See ARATEIA. Polybius gives us a high character of Aratus's Commentaries on History, which are lost.

ARATUS, the son of the above, was also prætor of the Achæan league, and poisoned by the ungrateful tyrant of Macedonia.

ARAU, a town of Switzerland, in the canton of Aargau, lying on a hill on the Aar. A covered bridge serves to unite the two sides of the river. Linen, cotton, and silk manufactures are considerable for the size of the place. It became subject to the canton of Berne in 1415, and has been commonly chosen for the general assembly of the Protestant cantons. During the French revolution it was at different times the seat of the Helvetic government; and, since the erection of Aargau into a separate canton, it has been its chief town. Thirty miles N. N. E. of Berne. Inhabitants 2000. Long. 7° 54′ E., lat. 47° 23′ N.

ARAVA, the name of, 1. a district, 2. a fortress, and 3. a river, in Upper Hungary. The fort is seated seventy-two miles north-west of Cassovia. Long. 20° 0′ E., lat. 49° 20′ N.

ARAUCANIANS, a nation of Indians of the kingdom of Chili, who inhabit a delightful country, situate between the rivers Biobio and Valdivia, and between the Andes and the sea, extending from 36° 44′ to 39° 50′ of S. lat. They derive their appellation of Araucanians from the province of Arauco, which, though the smallest in their territory, has given its name to the whole nation. The Spaniards were never able to reduce them. The progress of the new republics in this direction may be expected to turn the natural advantages here possessed to better account. Some curious details are given of their manners; and their history is interesting. Their country is divided into four nearly equal districts or portions, called in the language of the country mapus, deriving their names from their relative situation with regard to the sea or the Andes: as the Lanquen Mapu, or the maritime division; Lelbun Mapu, or plain country; Inapire Mapu, or country near the Andes; and Pire Mapu or country of the Andes. These great divisions are again subdivided into provinces, and the provinces into districts, which might be termed counties. The Puelches, once a distinct nation, now compose a tribe in union with the Araucanians. The three different divisions of the kingdom into tetrarchates, provinces, and districts, lay the foundation for three different orders of nobility by which they are respectively governed. These gradations are, beginning with the highest dignity, toques, apoulmenes, and ulmenes. The first presides over a tetrarchate, and of course commands the inferior officers who govern the provinces or counties which it contains; the second governs a province, and has under him the governors of the counties which his province includes; and to the third only a county is allotted. These titles and privileges are hereditary, following the law of primogeniture in the male line, and have their respective badges of distinction: the toqui a stone hatchet; the apo ulmen a silver-headed baton, encircled by a ring on the middle; and the ulmen a baton simply with a silver head. The common people seem to be jealous of their freedom, and eagerly disposed to resist encroachments on their privileges. The criminal jurisprudence is defective, and, like that of most barbarous nations, permits the offended party to punish, in his own name and authority, the person who has done him injury. Murder may be compounded for by a remuneration to the friends of the deceased; and the patria potestes extends to the father the privilege of putting his children to death without enquiry or condemnation. The Araucanians are distinguished for their spirit, their invention, and their wise regulations in the military system. Upon a declaration of war the whole armies of the state are entrusted to the command of a generalissimo, who is invested for the time with very extensive authority, and has the selection of his officers and inferior agents. They now announce their resolution to their neighbours by means of a bundle of arrows tied with a red string, and solicit assistance or alliance. The number of men that, upon emergency, they can bring into the field is variously stated, but generally does not exceed 5 or 6000 men. In their contests with the Spaniards, they felt the destructive effects of cavalry, and saw that for their defence a similar species of force was necessary. Accordingly we are told that in a few years afterwards they could muster several squadrons of horse. Their army is divided into bodies of 1000 men each, and these bodies are again subdivided into companies of 100. They wear no uniform, but are provided with a kind of armour composed of hardened leather. Their offensive weapons consist of swords and lances for their cavalry, of clubs and pikes for their infantry. They are fatally acquainted with the use of gunpowder, as in their contests with the Spaniards it spread destruction among their ranks; but they are totally ignorant of the art of manufacturing it. In the field they display great intrepidity, and after victory commit many atrocities. Among these, what is called the pruloncon, or death-lance, is the most shocking. After battle a circle of officers surround the battle-axe of their general, guarded by four lances, representing the four grand divisions of the state. Into this circle the captive is igno-

miniously conducted upon a horse deprived of its ears and tail; and having his face turned to his native land, is compelled to throw, into a hole that he has dug in the earth, a number of sticks, mentioning at each throw a celebrated hero of his country. This furnishes the victors with an opportunity of cursing the person of the inimical chiefs; and, when the list is finished, the sticks are covered up as if to represent their interment. When the captive has finished this ceremony, his own doom follows. His brains are dashed out with a club by his barbarous foes; the heart extracted while yet quivering with life, and a part of its blood sucked in succession by the ring of officers who preside at the sacrifice. His bones are then formed into flutes for playing their war music, and his skull is first carried round on a pike amid the shouts of the soldiery, and then, if not entirely shattered by the blow of the club, used as a drinking cup for the revelry that follows. When a treaty of peace with Europeans is the object, a plain between the Bio-Bio and the Duqueco has been generally appointed for a congress with the Spanish president. Each of the tetrarchates sends a deputy to this assembly; and without the concurrence of all, no peace can be concluded. The chief toqui opens the conference, by presenting a branch of the cinnamon tree as the emblem of peace, and accompanying the ceremony with a speech. To this the Spanish president replies. The treaty is then ratified by the sacrifice of camels; and, in token of mutual friendship, the authorities on both sides dine together, and exchange presents. The religious belief of the Araucanians is simple, and their religious ceremonies few and not frequently performed. They have placed over the world a supreme being, and under him many subordinate divinities with a distribution of power similar to what prevails in their own political state. The inferior divinities are of different sexes; and, as they do not stand in need of the assistance of their worshippers, they do not trouble them with their homage. Hence they are indifferent, and indifference produces toleration. They believe in the immortality of the soul, the existence of ghosts, and the power of sorcerers. They have funeral ceremonies not unlike those of the Romans. In the division of the year they make twelve months of thirty days each, and dispose of the five intercalary days by placing them in the last month. Their year commences on the 22d of December, at the solstice of Capricorn. Their arts and sciences are of course confined within very narrow limits. A species of forcible and figurative oratory is much practised among them, as among most savages, and the gift of poetical talent is held of the same estimation, and employed in the same service, as among other natives in a similar stage of civilisation. The medical art among all rude nations is highly prized, and generally forms an alliance with sorcery or divination. Here it maintains similar honors, and enters into similar connexions. In their domestic state and manners, the Araucanians are not much raised above the other tribes of the new continent. Polygamy is permitted by their laws; and the only limitation to the number of women is formed by the disposition or the fortune of the husband, who, according to the custom of savages, pays a dowry or purchase money to the father of every woman he marries. Although one man may have a number of wives, all joined to him by the same ceremonies, the first married is always regarded as the legitimate one, and the rest in a certain sense subordinate to her. Each wife is obliged to prepare a dish for her husband in her own separate kitchen, and 'the number of fires a man keeps,' becomes thus the measure of his opulence. Their houses are generally neat and cleanly. In their persons they are said to be well formed, strong, and active. The females are celebrated for their beauty, and the elegant dress that heightens their charms. Their food consists principally of Indian corn and potatoes, with a very sparing use of flesh, which they either simply boil or roast. Although they could command plenty of fish, they seem averse to the use of it. Their drinks are mostly beer or cider; but when they can obtain wine they testify a great fondness for it. In general they are temperate, perhaps from necessity; but at their public entertainments revelry and riot frequently preside. Unacquainted with the use of precious metals as money, barter is their usual mode of effecting transfers. Their principal trade is derived from an intercourse with the Spaniards, with whom they exchange horses, horned cattle, ostrich feathers, &c. for iron-ware, cutlery, grain, and wine. They are said to sell to the Spaniards 40,000 of the cloaks called ponchi every year.

About the year 1450, an inca of Peru attempted the conquest of Chili, and consequently of Araucania along with it; but his army retired on being defeated in a sanguinary engagement. A century later the Spaniards resolved to extend their conquests in this direction, but were opposed by the Araucanians with a body of 4000 men, led beyond their own confines; and whose conduct impressed the Spaniards with a fear of them that has never been extinguished. At length some settlements were formed within their boundaries; but about the year 1553 a period of bloody warfare ensued; and the resentment of the Araucanians was inflamed against the Spaniards by their barbarous mutilation of those unfortunate prisoners who fell into their hands. One of their bravest commanders, Caupolican, being betrayed after a gallant resistance, was condemned to be impaled alive, and shot with arrows: when brought to the place of punishment, and beholding the ignominy that awaited him, he hurled the executioner from the scaffold, exclaiming, 'Is there no sword, and some less cowardly hand to be found to put to death a man like myself? This has nothing of justice in it,—it is base revenge.' Various successes and discomfitures ensued, when, about the termination of the sixteenth century, the Araucanians besieged the enemy in the fortress of Puren. Unable to reduce the place so speedily as he desired, their chief presented himself before it, mounted on a fine horse recently taken from the governor, and challenged the commander, Don Garcia Ramon, to single combat at the end of three days. The defiance being accepted, the chieftains met, each accompanied by a small body of men who stood at a distance. Putting spurs to their horses, they ad-

vanced impetuously, but at the first encounter the Araucanian toqui was pierced through the body by his adversary's lance. Refusing to acknowledge himself vanquished, he endeavoured to remount his horse, but in doing so expired. These events were followed by the siege of Villarica, a rich and populous city belonging to the Spaniards, which, after a resistance of two years and eleven months, fell into the hands of the Araucanians. A similar fate awaited Imperial and Osorno, cities of equal importance, and their inhabitants were led into captivity.

Incessant wars, with very short intervals of repose, occupied almost the whole of the seventeenth century, and thousands after thousands fell in their prosecution: during these wars the Araucanians received an important accession to their strength, in the union of a warlike tribe called Puelches, before alluded to. The eighteenth century did not open more auspiciously; for, although a cessation of hostilities had prevailed some time, the Araucanians became sensible that it afforded opportunities for the Spaniards to form new and permanent establishments within their territories: the arrogance of those who resided among them, under pretence of protecting the missionaries, had also excited their indignation. Villumilla, a man of low origin but distinguished abilities, was appointed military toqui, or commander-in-chief, and formed a plan for expelling the Spaniards from the whole coast. But his attempt to raise his own and the neighbouring countries, in the year 1723, proved abortive, and the war was marked by nothing except some inconsiderable skirmishes. Peace having been restored, the Spanish governor conceived a scheme for the civilisation of the Araucanians (regarded as chimerical by those best acquainted with them), by persuading them to live in cities. They agreed, however, to build a city, and were supplied with materials by the Spaniards, who also had assistants and superintendents on the spot, but suddenly seizing their arms they killed their overseers. Peace was once more interrupted by repeated encounters, and at length a bloody battle ensued in the year 1773. The Spaniards found themselves unable to retain any settlement within the Araucanians' territories, and the natives, in opposition to all the skill and force employed against them, have ever since been able to keep possession of the district. See Molina on the Natural and Civil History of Chili, Alcedo's Geographical and Historical Dictionary, &c.

ARAVACOURCHY, or ARRIVACOURCHY, (the seat of Arava, a former chief of the Bagda cast,) a small town of Hindostan, in the district of Coimbetoor, distant twenty miles east of Darporum, and fifty-three west of Trichnipoly.

ARAUCARIA, in botany, a genus of the class and order dicœcia, monadelphia. Male: CAL. scales of an ament, terminated by a leaflet; corolless; antheræ ten or twelve without filaments. Female: CAL. an ament with many germs; corolless: STIGM. two-valved unequal; seeds numerous in a roundish cone. The only known species is a native of Chili.

ARAUNAH, or ORNAN, the Jebusite, a public-spirited husbandman under David king of Israel, who generously offered the king a free gift of his threshing-floor, wheat, oxen, and field, when he heard of David's intention of purchasing them to build an altar. See 2 Sam. xxiv. and 1 Chron. xxi. Araunah's field was afterwards the site of the temple.

ARAURE, a city of Venezuela, in South America, situated on the shores of the Acarigua, and north-north-east of the city of Truxillo. The establishment of this city was the result of the mild and enlightened policy of the first Capuchin missionaries, who by persuasion brought the Indians under the restraints of civilised life, and collected them on this spot. The surrounding country is fertile. The principal occupation of the inhabitants is rearing of cattle, with which they unite the cultivation of cotton and a little coffee. The streets of the town are straight, and the houses well-built. It has a handsome square and church.

ARAUSIO, CIVITAS ARAUSIENSIS, or ARAUSICORUM, in ancient geography, the capital of the Cavares, in Gallia Narbonensis. It is called Colonia Secundanorum, by Pliny and Mela, because the veterans of the second legion were settled in it. It was then a very important place, and had a triumphal arch, erected by Marius and Batulus, upon their victory over the Cimbri and Teutones. It is now called Orange, and has still the remains of a fine amphitheatre, and some aqueducts. See ORANGE.

ARAXES, now ARAS, a river of Armenia Major, which takes its rise in a mountain called Albos, where the Euphrates also has its origin From this mountain it runs south-east across Armenia and part of Persia, in a serpentine course; discharging itself into the Caspian Sea, after a run of upwards of 500 miles, during which it receives some considerable rivers. Walker describes it as falling into the Kur or Cyrus, before it arrives at the ocean. Some have imagined that it has its rise in mount Ararat; but Tournefort assures us that it comes no nearer that mountain than twelve miles. The Araxes is a very rapid river, and is supposed to be the Gihon mentioned by Moses. Besides this extreme rapidity it is very apt to overflow after rains; so that the endeavours to build bridges over it have proved abortive; though some of them appear, from the few arches remaining, to have been built of the best materials, and in the strongest manner. Such is the vehemence of its current after the thawing of the adjacent snows, or some fierce rains, that neither banks nor dykes can resist it. Nothing can exceed the noise and violence of its waves at such times; but in winter, when its waters are low, it is fordable in some places on camels.

ARAYA, a cape of South America, which forms the north point of the Orinoco. It concontains salt pits, from which the Dutch used to supply themselves freely, till 1605, when their ships were destroyed by the Spaniards, who, in 1622, built a fort upon it.

ARBA, a city of the Anakims, afterwards called Hebron.

ARBACES, a governor of Media under Sardanapalus. Seeing him spinning among a company of his women, he stirred up his people to

revolt, and dethroned Sardanapalus, who thereupon burnt himself in his palace. Arbaces being crowned, began the monarchy of the Medes, which lasted 317 years under nine kings, till Astyages was expelled by Cyrus. Arbaces reigned twenty-two years, and died A. M. 3206. See MEDIA.

ARBAI, a name that has been given to a cluster of islands in the South Pacific Ocean, including Annamooka and some others.

ARBALET, in the ancient art of war, a cross-bow made of steel, set in a shaft of wood, with a string and trigger, bent with a piece of iron fitted for that purpose, and used to throw bullets, large arrows, darts, &c. Also a mathematical instrument called a Jacob's Staff, to measure the height of the stars upon the horizon.

ARBALETE à jalet, Fr. a stone bow.

ARBALETRIER, Fr. a cross-bow man.

ARBALETRIER d'une galière, Fr. that part of a galley where the cross-bowmen were placed during an engagement.

AR'BALIST, AR'BALISTER, AR'CUBALIST, ARCUBAL'ISTER. } Fr. *arbaleste;* one who casts or shoots from a bow, a bow-man, an archer. Arcubalist, from barbarous Lat. *arcubalista*, from *arcus*, a bow, and *βαλλω*, to throw. One who throws or casts from a bow.

An *arbalaster* (or archibalister), standing upon the wall, and seeing his time, charged his steel bow with a square arrow, or quarrell, making first his prayer to God, that he would direct that shot, and deliver the innocency of the besieged from oppression.

Speed. Richard I.

It is reported by William Brito, that the *arcubalista* or *arbalist* was first showed to the French by our king Richard the first; who was shortly after slain by a quarrel thereof. *Camden.*

ARBE, an ancient city, the capital of the island of that name, situated on a rising ground between two harbours, which form a peninsula. It is the seat of a bishop, under the metropolitan of Zara. The inhabitants, who amount to 1400, maintain themselves by the tillage of the ground, the breeding of cattle, and fishing. Salt is obtained in great quantities from the sea water, and forms, with fruit and cattle, an object of traffic.

ARBE, or ARBA, in ancient and modern geography, an island of Illyria, in the gulf of Quarnero. It is about thirty Italian miles in circuit, and contains 4000 inhabitants, whose dwellings are scattered in various parts of the island. The part next the coast of Morlachia is mountainous, and uninhabited; but the four great valleys are uncommonly pleasant and fruitful. Besides corn and olives, they yield excellent wine and figs; but the severity of the climate in winter and spring, and especially the sharp north wind, often blasts the prospects of the husbandman. Hides, wool, sheep, hogs, fish, and excellent horses, are its principal exports.

The climate of Arbe is none of the happiest; the winter season is horrid, especially when agitated by the violent northerly winds, which sometimes transform the intermediate seasons into winter, and cause the summer itself to disappear. These furious winds do great damage to the island, particularly in the winter and spring. Some few years ago about 12,000 sheep perished in one night by cold, in the common pastures of the mountain, where, according to the custom of all Dalmatia, they are left in the open air the whole year round. The salt fog raised by the dreadful commotion of the waves, which often roars between the mountains of Arbe and the opposite Alps, in the narrow channel of Morlacca, consumes all the buds of the plants and corn, if it happens to be driven upon the island by the wind, and is followed by a scarcity of every kind of product. This calamity communicates its baneful influence even to the flesh of the animals left on the pastures; and it becomes ill-tasted, in consequence of the bitterness and bad nourishment of the food. Abstracting from these irregularities, the air of Arbe is healthful; nor ought the constant summer fevers among the inhabitants to be attributed to its influence, as they are, more probably, derived from unwholesome food.

Among the most remarkable curiosities of the island, the Arbegiani were until lately very proud of the head of S. Cristofano their protector, and the three heads of Shadrach, Meshech, and Abednego! In the last century there was a learned bishop of Arbe, named Ottavio Spaderi, who would not permit the reliques of S. Cristofano to be exposed to the public veneration on the solemnity of the saint's day, because he doubted of their authenticity. The mob rose and was going to throw him down from the top of the hill on which the cathedral stands; nor did the tumult cease after the day was past. The government sent an armed vessel to deliver the prelate from the danger he was in; and the pope thought proper to give him a more tractable spouse in Italy. That Arbe was inhabited by civilised people in the time of the Romans is evident by the inscriptions frequently discovered, and others that still remain at Arbe. In the lower ages it partook of all the calamities to which the neighbouring countries were subjected, but recovered itself even after dissolution. The archives of the community of Arbe contain some ancient papers that are truly valuable, and are kept with great jealousy; by them it appears that in the eleventh century gold and silk were not rare among the inhabitants. Arbe was subject to the kings of Hungary; afterwards it became dependent on Venetian feudatories; and at last was taken under the immediate dominion of that republic, until its possessions passed to the Austrians.

ARBELA, in ancient geography, a city of Assyria, famous for the third and decisive battle fought near it, between Alexander the Great and Darius Codomanus. It is seated on the Lysuc, on a fine plain, sixty miles south-east of Mousul, the ancient Nineveh, and is now called Irbil. This great battle was fought A. A. C. 331, and the event of it determined the fate of the Persian empire. Arrian relates that Darius's army consisted of 1,000,000 of foot and 40,000 horse; according to Diodorus there were 200,000 horse and 800,000 foot; Plutarch relates that the horse and foot together made up 1,000,000; and Justin gives us exactly half Diodorus's number. The Macedonian army, according to Arrian, consisted of 40,000 foot and 7000 horse. Upon receiving notice of the vast strength of the enemy,

Alexander expressed neither surprise nor apprehension; but having (according to Dr. Gillies in his Hist. of Anc. Greece) 'commanded a halt, he encamped four days, to give his men rest and refreshment. His camp being fortified by a good entrenchment, he left in it the sick and infirm, together with all the baggage; and, on the evening of the fourth day, prepared to march against the enemy with the effective part of his army, which was said to consist of 40,000 infantry and 7000 horse, unincumbered with any thing but their provisions and armour. The march was undertaken at the second watch of the night, that the Macedonians, by joining battle in the morning, might enjoy the important advantage of having an entire day before them, to reap the full fruits of their expected victory. About half way between the hostile camps some eminences intercepted the view of either army. Having ascended the rising ground, Alexander first beheld the barbarians, drawn up in battle array, and perhaps more skilfully marshalled than he had reason to apprehend. Their appearance, at least, immediately determined him to change his first resolution. He again commanded a halt, summoned a council of war; and different measures being proposed, acceded to the single opinion of Parmenio, who advised that the foot should remain stationary until a detachment of horse had explored the field of battle, and carefully examined the disposition of the enemy. Alexander, whose conduct was equalled by his courage, and both surpassed by his activity, performed those important duties in person at the head of his light horse and royal cohort. Having returned with unexampled celerity, he again assembled his captains, and encouraged them by a short speech. Their ardor corresponded with his own; and the soldiers, confident of victory, were commanded to take rest and refreshment. Meanwhile Darius, perceiving the enemy's approach, kept his men prepared for action. Notwithstanding the great length of the plain, he was obliged to contract his front, and form in two lines, each of which was extremely deep. According to the Persian custom the king occupied the centre of the first line, surrounded by the princes of the blood and the great officers of his court, and defended by his horse and foot guards, amounting to 15,000 chosen men. These splendid troops, who seemed fitter for parade than battle, were flanked on either side by the Greek mercenaries and other warlike battalions, carefully selected from the whole army. The right wing consisted of the Medes, Parthians, Hyrcanians, and Sacæ; the left was chiefly occupied by the Bactrians, Persians, and Cardusians. The various nations composing this immense host were differently armed, with swords, spears, clubs, and hatchets; while the horse and foot of each division were promiscuously blended, rather from the result of accident than by the direction of design. The armed chariots fronted the first line, whose centre was farther defended by the elephants. Chosen squadrons of Scythian, Bactrian, and Cappadocian cavalry, advanced before either wing, prepared to bring on the action, or, after it began, to attack the enemy in flank and rear. The unexpected approach of Alexander within sight of his tents prevented Darius from fortifying the wide extent of his camp; and, as he dreaded a nocturnal assault from enemies who often veiled their designs in darkness, he commanded his men to remain all night under arms. This unusual measure, the gloomy silence, the long and anxious expectation, together with the fatigue of a restless night, discouraged the whole army, but inspired double terror into those who had witnessed the miserable disasters on the banks of the Granicus and the Issus. At day-break Alexander disposed his troops in a manner suggested by the superior numbers and deep order of the enemy. His main body consisted in two heavy-armed phalanxes, each amounting to above 16,000 men. Of these the greater part formed into one line; behind which he placed the heavy-armed men, reinforced by his targeteers, with orders, that when the out-spreading wings of the enemy prepared to attack the flanks and rear of the first line, the second should immediately wheel to receive them. The cavalry and light infantry were so disposed on the wings, that while one part resisted the shock of the Persians in front, another, by only facing to the right or left, might take them in flank. Skilful archers and darters were posted at proper intervals, as affording the best defence against the armed chariots, which (as Alexander well knew) must immediately become useless whenever their conductors or horses were wounded. Having thus arranged the several parts, Alexander, with equal judgment, led the whole in an oblique direction towards the enemy's left; a manœuvre which enabled the Macedonians to avoid contending at once with superior numbers. When his advanced battalions, notwithstanding their nearness to the enemy, still stretched towards the right, Darius also extended his left, till fearing that by continuing this movement his men should be drawn gradually off the plain, he commanded the Scythian squadrons to advance, and prevent the farther extension of the hostile line. Alexander immediately detached a body of horse to oppose them. An equestrian combat ensued, in which both parties were reinforced, and the barbarians finally repelled. The armed chariots then issued forth with impetuous violence; but their appearance was only formidable; for the precautions taken by Alexander rendered their assault harmless. Darius next moved his main body, but with so little order that the horse mixed with the infantry, advanced, and left a vacuity in the line, which his generals wanted time or vigilance to supply. Alexander seized the decisive moment, and penetrated into the void with a wedge of squadrons. He was followed by the nearest sections of the phalanx, who rushed forward with loud shouts, as if they had already pursued the enemy. In this part of the field the victory was not long doubtful; after a feeble resistance, the barbarians gave way; and the pusillanimous Darius was foremost in the flight. The battle, however, was not yet decided. The more remote divisions of the phalanx, upon receiving intelligence that the left wing, commanded by Parmenio, was in danger, had not immediately followed Alexander. A vacant space was thus left in the Macedonian line, through which some

squadrons of Persian and Indian horse penetrated with celerity, and advanced to the hostile camp. It was then that Alexander derived signal and well-earned advantages from his judicious order of battle. The heavy-armed troops and targeteers, which he had skilfully posted behind the phalanx, speedily faced about, advanced with a rapid step, and attacked the barbarian cavalry, already entangled among the baggage. The enemy, thus surprised, were destroyed or put to flight. Meanwhile the danger of his left wing recalled Alexander from the pursuit of Darius. In advancing against the enemy's right, he was met by the Parthian, Indian, and Persian horse, who maintained a sharp conflict. Sixty of the companions fell; Hephæstion, Cœnus, and Menidas, were wounded. Having at length dissipated this cloud of cavalry, Alexander prepared to attack the foot in that wing. But the business was already effected, chiefly by the Thessalian horse; and nothing remained to be done, but to pursue the fugitives, and to render the victory as decisive as possible. 'According to the least extravagant accounts, with the loss of 500 men he destroyed 40,000 of the barbarians, who never thenceforth assembled in sufficient numbers to dispute his dominion in the east. The invaluable provinces of Babylonia, Susiana, and Persis, with their respective capitals of Babylon, Susa, and Persepolis, formed the prize of his skill and valor. The gold and silver found in those cities amounted to thirty millions sterling; the jewels and other precious spoil belonging to Darius, sufficed, according to Plutarch, to load 20,000 mules and 5000 camels.' The consequences of this victory the reader will find under the article PERSIA.

ARBERG, or AARBERG, a fortified town of Switzerland, in the canton of Bern, with an ancient castle. It is seated on the Aar, in a kind of island, ten miles N. W. of Berne.

AR'BITER, *v.* & *n.*
AR'BITRESS,
AR'BITRABLE,
AR'BITRARY,
AR'BITRARILY,
AR'BITRARINESS,
ARBITRA'RIOUS,
ARBITRA'RIOUSLY,
AR'BITRATE,
ARBITRA'TION,
ARBITRA'TOR,
ARBIT'REMENT.

Lat. *arbiter*; according to eminent etymologists, from *ad*, *ar* for the sake of euphony, and the ancient *bito*, for *eo*, to go. One who goes to examine or settle differences for another, either in a court of justice, or chosen by contending parties to adjust their respective claims amicably. Arbitrary, and the words more immediately connected with it, signify that the decision of the arbiter is made in consequence of his own uncontrolled will, or in consequence of reasons which do not appear.

Contrariwise, certain Laodiceans, and lukewarm persons, think they may accommodate points of religion by middle ways, and taking part of both, and witty reconcilements; as if they would make an *arbitrement* between God and man.

Lord Bacon's Essays.

Let the rule of justice be the laws of the land; an impartial *arbiter* between the king and his people, and between one subject and another. *Id.*

But now the *arbitrator* of despairs,
Just death, kind umpire of man's miseries,
With sweet enlargement doth dismiss me hence.

Shakspeare.

The end crowns all;
And that old common *arbitrator*, Time,
Will one day end it. *Id.*

K. RICH. There shall your swords and lances *arbitrate*
The swelling diff'rence of your settled hate;
Since we cannot atone you, you shall see
Justice decides the victor's chivalry.

Id. Richard II.

I know the knight is incensed against you, even to a mortal *arbitrement*; but nothing of the circumstance more. *Id.*

Stand fast! to stand or fall
Free in thine own *arbitrament* it stands:
Perfect within, no outward aid require,
And all temptation to transgress repel. *Milton.*

Next him, high *arbiter*,
Chance governs all. *Id.*

His majesty, in this great conjuncture, seems to be generally allowed for the sole *arbiter* of the affairs of Christendom. *Temple.*

He governed *arbitrarily*: he was expelled, and came to the deserved end of all tyrants. *Dryden.*

The ordinary revenue of a parsonage is in land, called the glebe; in tythe, a set part of our goods, rendered to God; in other offerings, bestowed upon God by the people, either in such *arbitrable* proportion as their own devotion moveth them, or as the laws or customs of particular places do require them.

Spelman.

As the satisfactions arising from memory are less *arbitrary*, they are more solid; and are, indeed, the only joys which we can call our own. *Rambler.*

Albion, sea-embraced,
The joy of freedom, dread of treacherous kings,
The destin'd mistress of the subject main,
The *arbitress* of Europe, now demands
Thy presence, goddess.

Glover's London, p. 20.

It is a sign from Jove.
Now follows war with all its woes again,
Or peace between us, by his fix'd award,
For Jove is *arbiter* of both to man.

Cowper's Iliad, book iv.

ARBITER. Also a judge nominated by a magistrate to decide differences between parties. The civilians make a difference between arbiter and arbitrator, though both found their power on the compromise of the parties; the former being obliged to judge according to the customs of the law, whereas the latter is at liberty to use his own discretion, and accommodate the difference in the manner that appears to him most just and equitable.

ARBITRARY PUNISHMENT, in law, denotes such punishments as are by statute left to the discretion of the judge. It is a general rule in arbitrary punishments that the judge cannot inflict death. Hence, all punishments that are not capital, have acquired the name of arbitrary punishments, even although they be expressly pointed out by statute.

ARBITRATION, in law, is where the parties, injuring and injured, submit all matters in dispute, concerning any personal chattels or personal wrongs, to the judgment of two or more arbiters or arbitrators, who are to decide the controversy: and if they do not agree, it is usual to add, that

another person be called in as an umpire (imperator or impar), to whose sole judgment it is then referred. Sometimes there is only one arbitrator originally appointed. This decision, in any of these cases, is called an award: and thereby the question is as fully determined, and the right transferred or settled, as it could have been by the agreement of the parties, or judgment of a court of justice. See LAW.

ARBITRIO, in music, is equivalent to ad libitum, al suo arbitrio, at your pleasure; al suo commodio, at your convenience; as in lessons and solos, and in the solo parts of concertos, where all the other parts wait at a pause or close, on the pleasure of the principal performer.

ARBLASTER, a cross-bow.

ARBOGA, an ancient and neat inland town of Sweden, in Westmania, seated on the Stora, a little above where it falls into the Maerler Lake, sixty-six miles west of Stockholm. A canal, called the canal of Arboga, brings it into communication with Stockholm, through the lake of Mulur; and with Orebro, through the lake of Hielma. The chief objects of trade are saddlery, and the iron wrought in the neighbouring forge at Jader. In the vicinity of the town there is still to be seen a sacred grove, and other remains of Pagan worship. The country round is inferior to no part of Sweden.

ARBOIS, a small populous town of France, in Franche Comte, famous for its wines. It is situated eighteen miles south-east of Dole, and contains 6000 inhabitants.

ARBOLETES, CIENEGA DE LOS, a port of South America, on the Atlantic, in the province of Carthagena. It is sheltered from every wind, and irrigated by a small river of delicious water.

ARBON, a town in the Swiss canton of Thurgau, on the lake of Constance, which at one time belonged to the bishop of Constance, and is now the capital of a district. Here is a castle which was the residence of the governor. The inhabitants, who are almost all Calvinists, enjoy extensive liberties, and are joined in a friendly compact with other places in Switzerland. The parish church is the joint property of the Calvinists and Catholics, six of the town counsellors being of the one denomination, and a like number of the other. It is a place of some trade: seven miles north of St. Gall.

ARBOR, ARBORES, in botany, a tree. Trees are by Linnæus classed in the seventh family of the vegetable kingdom, and are distinguished from shrubs in that their stems come up with buds on them; but this distinction does not hold universally, there being rarely any buds on the large trees in India.

ARBOR Americana fraxinifolus, in botany, the swietenia mahagoni of Linnæus.

ARBOR aquatica Brasiliensis, in botany. See ANINGA. Arbor aromatica Magellanica, winter's bark, or wild cinnamon-tree; the winter aromatica of Linnæus. Arbor camphorifica Japonica; the laurus camphora of Linnæus. Arbor crepitans; the hura crepitans of Linnæus. Arbor in aqua nascens, the nyssa denticulata of Linnæus. Arbor Judæ; the cercis of Linnæus. Arbor laurifolia venenata; the poison tree. Arbor saponaria, the sapindus saponaria of Linnæus. Arbor Virginiana benzoinum fundens; the laurus benzoin of Linnæus. Arbor vitæ; the thuja of Linnæus. Arbor zeylonica; the chionanthus zeylonica of Linnæus.

ARBOR, in chemistry, or ARBOR PHILOSOPHICA, is a name common to several metalline crystallizations; thus called, from their ramifications resembling a tree. Albertus Magnus is said to have produced a tree before the king of France while he sat at dinner. This passed at that time for a palingenesia, or resuscitation; but it may more naturally be referred to the species of germinations by crystallization.

ARBOR, in mechanics, the principal part of a machine which serves to sustain the rest: also the axis or spindle on which a machine turns, as the arbor of a crane, windmill, &c.

ARBOR DIANÆ, or ARBOR LUNÆ, a kind of crystallization, in which aqua fortis, incorporated with silver and mercury, being put in water, expands and shoots itself into an appearance of a tree, with branches, leaves, and flowers. See CHEMISTRY.

ARBOR GENEALOGICA, tree of genealogy, or consanguinity, signifies a lineage drawn out under the resemblance of a root, stock, branches, &c.

ARBOR HERMETIS, i. e. the tree of Hermes; among chemists, a process of the revivification of mercury.

ARBOR MARTIS, in chemistry, is a germination of iron, resembling a natural plant. It is the invention of the younger Lemery. On a dissolution of iron filings in spirit of nitre contained in a glass, he poured oil of tartar per deliquium: upon this, the liquor soon swelled very considerably, though with very little fermentation. When this subsided there appeared branches adhering to the surface of the glass, which, continuing to grow, at length covered it all over. The form of the branches was so perfect, that a kind of leaves and flowers were easily discovered.

ARBOR MARTIS, in natural history, is applied to coral, because it grows like a tree in the sea.

ARBOR PORPHYRIANA, among the schoolmen, a fanciful literary figure, consisting of three columns of words; the middlemost whereof contains the series of genera and species, and bears analogy to the trunk; and the extremes, containing the differences, to the branches of a tree. Thus, e g.

	SOCRATES.	
Greeks	ANTONINUS, &c.	Roman
Rational animals	MAN.	Irrational animals
Animate bodies	ANIMALS.	Inanimate bodies.
Thinking substances	BODY.	Extended substances
	SUBSTANCE.	

ARBOR SCIENTIÆ, a general scheme of science.

ARBOR VINE. See CONVOLVULUS.

ARBOR VITÆ. See THUYA.

AR'BORATOR, ARBO'REOUS, ARBORES'CENT, AR'BORET, AR'BORIST, AR'BOROUS. Arbor, a tree. The terminations or and ist, as usual, denote agency.—The other endings are obviously applied as epithets.

Now hid, now seen,
Among thick woven *arborets*, and flow'rs
Imbroider'd on each bank. *Milton.*

From under shady *arborous* roof,
Soon as they forth were come to open fight
Of day-spring and the sun. *Id.*

They speak properly who make it an *arboreous* excrescence, or rather a superplant bred of a viscous and superfluous lop, which the tree itself cannot assimulate. *Brown's Vulgar Errors.*

The nature of the mulberry, which the *arborists* observe to be long in the begetting his buds; but the cold seasons being past, he shoots them all out in a night. *Howel's Vocal Forest.*

In the time of this work would our ingenious *arborator* frequently incorporate, mingle, and unite, the arms and branches of some young and flexible trees, which grow in consort, and near to one another. *Evelyn. Sylva.*

Nonius supposes the tall rosea (*arborescent* hollihocks) that bears the broad flower, for the best. *Id.*

ARBOREA, in entomology, a species of podura described by Scopoli and others. It inhabits trees in Europe.—*Linnæus. Gmelin*

ARBOREA, in ornithology, a species of anas that inhabits Jamaica, and is called by Ray, Sloane, and Edwards, the black-billed whistling duck. It is the anas fistularis Jamaicensis of Brisson; canard siffluer de la Jamaique of Buffon Pl. Enl.; and siffleur à bec noir. Nat. Hist. Ois. of the same author.

ARBOREA, in ornithology, a species of the alauda genus. See ALAUDA.

ARBOREA, in zoology, a species of rana, called the tree-frog: defined by Gmelin as having itsbody granulated beneath, and the feet cleft. He enumerates eight supposed varieties of this species.

ARBORESCENS, in natural history, a species of doris (vermes mollusca), that inhabits the Norway seas. The feelers are ramose; back ribbous, and beset with protuberances.—*Müll. Zool. Gmelin.*

ARBORESCENT, an epithet applied to such objects as resemble trees, or that grow up in the form of trees. See ARBOR.

ARBORESCENT STAR-FISH, in zoology, a species of asterias. See ASTERIAS.

ARBORETI, in entomology, a species of curculio, that inhabits Cayenne. It is of a cineous color; thighs of the anterior legs toothed; wing-cases striated with punctures.—*Fabricius. Gmelin.*

ARBOREUM, in natural history, a species of cyonium (vermes zoophyta), found in the Norway and Indian seas.

ARBOREUS, in entomology, a species of mex.

ARBORIBONZES, in modern history, priests Japan, who live an erratic life, and subsist on ms. They dwell in caverns, and cover their ads with bonnets made of the bark of trees.

ARBOUR, *v.* & *n.* From arbor, a tree. According to Hickes from an air-bower. Skinner ites *herber* and *herberg*, a haven or harbour. place of retirement in gardens or pleasure-ounds, a nook which shades or shelters. According to the last derivation, a nook formed of unches is not an arbour, but a bower.

After diner we walked into ye gardine, and there rtely sitting in an *arber* begane to go forth in our —— *Sir Thos. More's Works*, fol. 177.

Downe fro the toure she gan to renne,
In to an *herber* all his owne,
Where many a wonder wofull mone,
She made. *Gower. Con. A.* book iv.

Nay, you shall see mine orchard; where, in an *arbour*, we will eat a last year's pippin of my own grafting. *Shakspeare.*

Let us divide our labours; thou where choice
Leads thee or where most needs; whether to wind
The woodbine round this *arbour*, or direct
The clasping ivy where to climb. *Milton.*

ARBOUR, in gardening, a kind of shady bower, formerly in great esteem; but of late rejected on account of its being damp and unwholesome. To prevent this, arbours have an opening to admit of free ventilation, as well as the rays of the sun. They are distinguished into natural and artificial. Artificial arbours and cabinets are made of lattice-work, borne up by standards, cross-rails, circles and arches of iron. For these arbours they use small fillets of oak, which being planted and made straight, are wrought in checkers and fastened with wire. Natural arbours are formed only of the branches of trees interwoven artfully, and borne up by a strong lattice-work, poles, hoops, &c. which make galleries, halls, porticoes, and green vistas, naturally covered. The trees wherewith these arbours are formed are usually the female elm, or lime-tree; because they easily yield, and by their great quantity of small boughs, form a thick brush-wood: the lower parts are usually filled up with horn-beams, honeysuckles, jasmines, &c.

ARBRISSEL (Robert d'), founder of the celebrated abbey of Fontevraud, was born about the year 1047, in the village of Arbrissel, Britanny, and studied in the university of Paris. The bishop of Rennes constituted him archpriest and official in his diocese, where he labored with so much zeal for the reformation of the priesthood, that the canons regarded him with great ill-will, and he retired to teach divinity at Angers. At length, disgusted, it is said, at the general corruption of manners, he withdrew into a desert, in order to lead a life of austerity; but the baron of Craon, moved by one of his sermons, founded an abbey for him. After two or three years he resigned his abbacy, and resumed his avocation of promiscuous preaching, when the multitude of his followers of both sexes becoming considerable, he resolved to fix them in the forest of Fontevraud, and was soon enabled to erect the monastery which rapidly became so rich and flourishing. Of his influence in the conversion of libertine women, the most extraordinary tales are told; and curious letters, addressed to him on this subject, by Geoffry abbot of Vendome, and Marbodus bishop of Rennes, are preserved; from which it appears, that he was accused of the vain-glory of frequently passing a night with them, in order to evince his resistance of temptation. The production of the letters of prior Geoffry, by father Sirmond in 1610, produced a violent controversy. D'Arbrissel died in 1117, and was buried in his own abbey.

ARBROATH. See ABERBROTHOCK.

ARBURG, or AARBURG, a town of Switzerland, in the canton of Bern, on the Aar. It is small but very strong, being seated on a rock,

and defended by a good fortress cut out of the rock.

ARBUSCULA is used by Bradley to denote a dwarf tree, above the rank of shrubs, but below that of trees, such as the elder.

ARBUSTIVA, in botany, the thirty-ninth order of plants in the Fragmenta Methodi Naturalis of Linnæus.

ARBUSTORUM, in conchology, a species of helix; a land-snail found in hedges and shrubberies in Europe. Also, in entomology, a species of musca.

ARBUSTUM, in ancient horticulture, implies a number of trees planted for the sake of the fruit. The word was more peculiarly applied to a place planted with trees for fastening vines to, which are hence called by Columella arbustivæ. Arbustum is sometimes also used to denote an orchard, or field wherein trees are planted at such distance that there is room for ploughing and growing corn between.

ARBUTE, arbutus or strawberry tree. See ARBUTUS.

ARBUTELLA, in entomology, a species of phalæna, the tinea of Linnæus.

ARBUTHNOT (Alexander), principal of the university of Aberdeen, in the reign of James VI. of Scotland, was born in 1538. He studied first at Aberdeen; and was afterwards sent over to France, where, under the famous Cujacius, he applied himself to the civil law. In 1563 he returned to Scotland and took orders. In 1568 he was appointed minister of Arbuthnot and Logie-Buchan; and in 1569 made principal of the King's College at Aberdeen. In the general assembly which met at Edinburgh in 1573 and 1577, he was chosen moderator; and, to the end of his life, was an active supporter of the reformed religion. He died in 1583, in the forty-fifth year of his age; and was buried in the College Church of Aberdeen. We are told in the Biographia that he was eminent as a poet, a philosopher, a mathematician, a lawyer, a divine, and a physician. He wrote Orationes de Origine et Dignitate Juris, printed at Edinburgh, 1572, 4to. His contemporary Thomas Maitland wrote a copy of Latin verses on the publication of this book: they are printed in the Delic. Poetar. Scot. He published Buchanan's History of Scotland in 1582.

ARBUTHNOT (John), M. D. was born in the parish of Arbuthnot, and was educated, and graduated at Aberdeen. He was the son of Alexander Arbuthnot, episcopal minister of that parish, who was deprived for nonconformity in 1689. The difficulties in which his family was involved, on account of their political principles, determined him to go to London, where for some time he taught mathematics; and while he was thus employed, he published his Examination of Dr. Woodward's Account of the Deluge. This tract, which abounded with learning and good sense, made him known. He published soon after, his Essay on the Usefulness of Mathematics. In the profession of physic, he advanced by slow but sure degrees; and his reputation in it was at length fully established, by a successful cure which he performed on Prince George of Denmark Queen Anne, in consequence of it, appointed him one of her physicians in ordinary in 1709; and, some years before this, his extensive knowledge had procured his admission into the Royal Society. His talents and worth were his strongest recommendations to men of wit and learning; and he entered into particular connexions with Pope and Swift, with whom he joined in publishing several volumes of miscellanies; among which are the well-known Memoirs of Martinus Scriblerus, a satire of infinite humor on the abuses of human learning. In 1715 he assisted Pope and Gay in the Three Hours after Marriage; a dramatic performance, which was brought upon the stage without success. In 1727 he published Tables of ancient Coins, Weights, and Measures; a work of great use and real erudition. In 1732 his valuable tract concerning The Nature and Choice of Aliments appeared; which, the year after, was followed by his remarks on The Effects of Air on Human Bodies. A constitutional asthma had distressed him at different periods of his life, and proved fatal to him in 1734. Dr. Arbuthnot appears to have been in all respects a most accomplished and amiable person. He has showed himself equal to any of his contemporaries in wit and learning, and he was superior to most men in the moral duties of life, and in acts of humanity and benevolence. His letter to Mr. Pope, written as it were upon his death-bed, and which no one can read without emotion, discovers such a noble fortitude of mind at the approach of his dissolution, as could be inspired only by a clear conscience, and the calm retrospect of an uninterrupted course of virtue. In 1751 came out, in two vols. 8vo. printed at Glasgow, The Miscellaneous Works of the late Dr. Arbuthnot; which are said to comprehend, with what is inserted in Swift's Miscellanies, all the pieces of wit and humor of this admirable author; but the greater part of them is denied by his son to be his composition. When his attention was attracted by any singular occurrence, he generally wrote his thoughts upon it in a large folio which he kept in his parlour; and from this probably some slight and imperfect essays, which had slipt from his memory, might get abroad into the world. A vein of good-natured pleasantry runs through all his pieces of this kind; and serves to confirm the character Swift gave of him to a lady desiring to know his opinion of Dr. Arbuthnot: 'He has more wit than we all have, and his humanity is equal to his wit.'

ARBUTI, in entomology, a species of phalæna (Noctua Linn.) found in England.

ARBUTUS, in botany, the strawberry tree: a genus of the monogynia order, and decandria class of plants; ranking in the natural method under the eighteenth order bicornes. The calyx is divided into five parts: the corolla is ovated; and the fruit is a berry with five cells. There are five species: viz. 1. A. Acadiensis, a native of Acadia. 2. A. Alpina, or mountain strawberry-tree, a native of Britain. 3. A. adrachne, or the oriental strawberry; so called, because it grows plentifully in many parts of the East; where the natives use it for various purposes. It grows to a very large size. 4. A. unedo, or common strawberry-tree, a native of

Italy, Spain and Ireland; and now very common in the British gardens. 1. A. unedo, the double-blossomed, differs from the others only in that the flowers are double; but this difference is so inconsiderable, that it will not be seen without looking into the flower. 2. A. unedo, the oblong-fruited, grows to be a middle sized tree in some countries; for we read of the large uses its wood has been applied to; such as, Arbuteæ crates, &c. Arbutean harrows, &c. With us it may be kept down to any size. 3. A. unedo, the red-flowered, differs in no respect from the common sort, only the flowers are red, and these constitute a variety from the other sorts of flowers; but the contrast is not so great between their fruit and them as of the other sorts, their color approaching too near to a sameness. 4. A. unedo, the round-fruited, has pitcher-shaped flowers, which are succeeded by a round scarlet fruit, as wide as they are long; and this is all the difference between this and the oblong-fruited sort.

All the above varieties thrive best in a wet soil, and are seldom hurt by hard winters, though the young and tender branches are often destroyed by frost; but, however dead the trees may appear, they ought always to be suffered to remain till the following summer shows what are living and what are dead. The method of propagating the varieties of the unedo is by layers and cuttings: the species itself may be raised from seed.—1. The operation by layers must be performed on the youngest twigs; and in some soils they will strike root pretty freely, whilst in others they can hardly be made to grow at all: but until they have lain two summers they need scarcely be looked for. When the roots are struck, the layers should be carefully taken off in the spring, and planted in separate pots; and after well watering them they should be plunged up to the rims in a hot-bed, and this will set them forward; for without this assistance many of the layers will be lost; since they are difficult plants to make grow. After the hot-bed has forced the seeds into a state of vegetation, the pots may be taken out, and plunged up to the rims in some natural mould, to keep them cool and moist; and here they may stand for two or three years, or longer, if the pots are large enough, without ever removing or sheltering them in winter; for they are hardy enough to resist our severest cold. When they are to be finally set out, all the mould may be turned out of the pots hanging to the roots; and having proper holes made ready, they may be planted in them, and the plant will be ignorant of its new situation. 2. The cuttings must be planted in pots, and have the benefit of a good bark bed: in which, being constantly shaded and duly watered, many of them will grow. As the plants raised this way will be rather tender by being forced in the bark bed, it will be necessary to remove them into the green-house, or to place them under a hot-bed frame during the first winter: and after that the pots may be set up to the rims in the ground, and, like the layers, the plants may be turned out at a convenient time into the places where they are to remain. 3. To raise them from seeds, these must be taken from the oblong or round-fruited sort. The seeds, which will be ripe some time in November or the beginning of December, (for they will not be ripe at the same time in all places,) must be then gathered; and, as they should not be sowed until the spring, it will be proper to put them into a pot or jar, mixing with them a quantity of drift sand; and this will preserve them sound and good. The beginning of March is the best time for sowing the seeds; and the best soil for them is maiden earth, taken from a rich pasture at least a year before, with the sward; and this, by constant turning, being well rotted and mixed, will be ready to receive them. Having filled a sufficient number of pots with this fine mould, let the seeds be sown, and but just covered, scarcely a quarter of an inch deep. A dry day should be chosen for the business; and no watering by the hand should be given them, as it will endanger the setting the mould hard in the pots. Leave them abroad until some rain falls, which at that time may be hourly expected; and after that, having a hot-bed ready, plunge the pots therein. In less than six weeks the plants may be expected to appear; when much air should be afforded them, and frequent waterings, in small quantities, gently sprinkled over them. After this they may be hardened to the air by degrees, and the pots set up to the rims in the natural mould, in a shady place. In October they should be removed into the green-house, or some shelter, in frosty weather; though they should always be set abroad in mild open weather. In the spring they may be shook out, and planted in separate pots; and they should have the advantage also of a hot-bed to set them a growing: their future management may be the same as was directed for the layers. When these trees are to be planted out, very little regard need be paid to the soil or situation; for they will grow almost anywhere, and resist our severest northern blasts. One thing, however, the gardener must constantly observe, to continue his trees in their beauty, viz. As often as a heavy snow falls, to shake the boughs; for it will lodge amongst the leaves and branches in such great quantity as to weigh down and split the largest branches; the deformity of which afterwards may be easily conceived. Besides, many years must expire before the tree will, if ever it should, grow to its former beauty; to preserve this, therefore, makes it highly necessary to watch these trees narrowly in snowy weather.

ARBUTUS UVA URSI is a plant lately discovered in the highlands of Scotland, and which formerly was thought not to be a native of Britain.

ARC', } *Arcus*, a bow or arch. See
AR'CUATE. } ARCH.

The cause of the confusion in sounds, and the inconfusion of species visible, is for that, the sight worketh in right lines; but sounds, that move in oblique and *arcuate* lines, must needs encounter and disturb the one the other.

Bacon's Natural History.

In the gullet, where it perforateth the midriff, the carneous fibres are inflected and *arcuate*.

Ray on the Creation.

Load some vain church with old theatric state,
Turn *arcs* of triumph to a garden gate.

Pope's Moral Essa—

ARC, or ARCK, a river of France, in the department of Mount Blanc, which rises in the Maurienne, and falls into the Isere. It has a very rapid course, and is full of cascades.

ARCA, in zoology, a genus of the class conchifera, order dimyaria, and family arcaceæ, in Lamarck's system. Its generic character is shell transverse, subequivalve, inequilateral; nates distant, separated by the area of the ligament. Hinge linear, straight, not ribbed at the extremities. Teeth numerous, arranged closely in a line. Ligament entirely external.

The Linnæan genus of this name comprehended those shells which now form the family arcaceæ, and consist of the genera cucullæa, arca, pectunculus, nucula. Arca Noæ, and A. barbata, are both English species of the restricted genus. The species enumerated by Gmelin are, tortuosa, noæ, barbata, modiolus, pella, ovata, pellucida, rostrata, striata, pulchella, afra, fossilis, cancellata, minuta, lactea, nodulosa, antiquata, senilis, granosa, corbicula, decussata, æquilatera, pallens, cucullus, magellanica, reticulata, candida, indica, jamaicensis, campechiensis, lata, senegalensis, undata, pectunculus, pectinata, glycymeris, pilosa, nummaria, nucleus, rhomboidea, marmorata, angulosa, scapha.

ARCA CYROGRAPHICA, in archæology, a common chest, with three locks and keys, kept by certain Christians and Jews, wherein all mortgages, &c. belonging to the latter were kept to prevent fraud, by order of Richard I. *Hoved. Annal.*

ARCA CORDIS is used by some anatomists to denote the pericardium.

ARCADE'. Fr. *arcade*, an arch. A term of architecture.

Or call the winds, through long *arcades* to roar;
Proud to catch cold at a Venetian door. *Pope.*

See distant mountains leave their valleys dry,
And o'er the proud *arcade* their tribute pour,
To lave imperial Rome. *Thomson. Liberty.*

ARCADE, in architecture, is also used to denote any opening in the wall of a building formed by an arch.

ARCADES, or ARCADIANS, the inhabitants of ancient Arcadia. Virgil greatly commended them for their love of, and skill in, music. 'To imitate the Arcadians,' is to labor and toil for the benefit of others, never conquering their own, but the enemies of others. This probably took its rise from the ancient Arcadians being accustomed to hire themselves out as mercenaries to foreign nations. Homer commends their martial prowess, their pastures, their sheep, and their well-watered country. They boasted of their great antiquity, and that they were older than the sun and moon! They were the first who had a year of three months, and were therefore called Proceleni, because their year was prior to that adjusted in Greece to the course of the moon.

ARCADIA, in ancient geography, an inland district in the heart of Peloponnesus. Homer designates it by the epithets of πολυμηλος, i. e. abounding in sheep; or μητηρ μηλων, i. e. the mother of sheep; or πολυπιδαξ, i. e. abounding in fountains. It is mountainous, and fitter for pasture than corn; and therefore chiefly celebrated by pastoral poets, who feigned Pan the god of shepherds, to be the guardian of it. It was bounded on the north by Achaia; on the east by Argos and Laconia; by Messenia on the south, and Elis on the west. According to Pliny, the wine of this country cured barrenness in women, and inspired the men with rage; and the berries of the yew gathered there were so strong a poison, that whoever slept or took refreshment under that tree were sure to die. In Strabo's time there were few cities remaining in it, most of them being destroyed in the Grecian wars. Eustathius says, that the country was anciently called Pelasgia, from Pelasgos, who brought the people, from roots, herbs, and leaves of trees, to feed on acorns, especially beechmast; as Artemidorus observes, that the Arcadians usually lived on acorns. It was also called Lycaonia, Gigantis, and Parrhasia. It is now called Traconia, and still abounds in corn, pastures and woods.

ARCADIA, a sea-port of the above province, near the gulf, and almost opposite to the Isle of Zante, sixty-four miles S. W. of Corinth.

ARCADIUS, emperor of the east, succeeded his father Theodosius the Great in 395, at which period his brother Honorius was emperor of the west. He died in 408.

ARCÆ CUSTOS, a title anciently given to the archdeacon on account of his having the custody of the church's chest, or treasure.

ARCANE', } Lat. *arcanum;* perhaps from
ARCA'NUM. } *arceo*, to keep in. A secret, a thing that nobody must be apprised of.

Have I been disobedient to thy words?
Have I bewray'd thy *arcane* secresy.
Tragedy of Locrine, v. 4.

In some mysterious paragraphs certain *arcana* are joined for brevity sake, which in the operation must be divided. *Swift's Tale of a Tub.*

ARCANGIS, in the Turkish armies, an inferior kind of infantry, which serve as enfans perdus, and to harass and pillage the enemy's frontiers. The Arcangis are an order inferior to the Janisaries; and when any of them distinguish themselves, are usually preferred into the Janisaries order.

ARCANIUS, in entomology, a species of papilio.

ARCANNA, in natural history, a kind of red chalk, called by physiologists rubrica fabrilis, as being used by carpenters to color their lines for marking timber, &c.

ARCANUM, among physicians, any remedy, the preparation of which is industriously concealed, in order to enhance its value. There are also standing official compositions under the denomination; such as, 1. Arcanum corallinum, a preparation of red precipitate; made by repeatedly distilling it with the spirit of nitre, till a fine red powder be procured, which being boiled, the water poured off, and tartarised spirit of wine put to the powder, two or three cohobations are made; which leave a powder, said to be of use in the gout, dropsy, scurvy, &c. operates chiefly by stool. 2. Arcanum duplicatum, or double secret, is prepared of the caput mortuum of aqua fortis, by dissolving it in hot water, filtrating, and evaporating it to a cuticle:

and then leaving it to shoot. It is extolled as a diuretic and sudorific. The recipe was purchased at the expense of 500 dollars, by that great virtuoso the duke of Holstein. Schroder, that prince's physician, writes wonders of its great uses in hypochondriacal cases, and in continued and intermitting fevers, stone, scurvy, &c. Mixed with the paste employed in binding books, it secures them effectually against all injury from that mischievous insect, the book-worm. 3. Arcanum duplicatum catholicum, a compound medicine administered by Wedelius and others, with great success, in a pestilential fever attended with dysentery, which raged for many years in Germany, and yielded to nothing so easily as to this medicine. It was composed of bezoar, plantain root, and the root of colchicum. 4. Arcanum Jovis is made of an amalgam of mercury and tin, digested in spirit of nitre; which being drawn off, the remaining matter is wetted with spirit of wine, and the spirit burnt several times, till the pungent taste is wholly gone: what remains is used as sudorific. 5. Arcanum tartari is a neutral salt soluble in water and spirit of wine, formed from the combination of vinegar with fixed alkali.

ARCANUM, in ancient geography, a villa of Q. Cicero, the orator's brother, in Latium; now Arce, in the Terra di Lavora, in the kingdom of Naples, on the borders of the Campagna di Roma, on the river Melpis, between Arpinum and Aquinum.

ARCAS, in heathen mythology, the son of Jupiter and Callisto, who was turned into a she-bear by Juno.

ARCBOUTANT; from arc, and bouter, to abut, Fr.; in building, an arched buttress. See BUTTRESS.

ARCELLA, in entomology, a species of phalæna (tinea) Gmelin. Inhabits Germany.

ARCEN-BARROIS, a town in France, in the department of Cote-d'Or, seated on the Aujon, thirty-five miles north of Dijon, and thirteen N. W. of Langres. Long. 5° 7′ E., lat. 47° 55′ N.

ARC-EN-QUEUE, in ornithology, the name of the Linnæan oriolus annulatus, in Buffon's Hist. Nat. des Ois.

ARCES, a town of France, in the department of Lower Charente.

ARCESILAUS, a celebrated Greek philosopher, born at Pitane, in Æolis, about A. A. C. 300. He founded the middle academy, called the second school, was a man of great erudition, and well versed in the writings of the ancients; but was called a caviller, or sceptic. See *Pers. Sat.* iii. v. 78.

Non ego curo
Esse quod Arcesilas, ærumnosique Solones,
Obstipo capite, et figentes lumine terram,
Murmura cum secum, et rabiosa silentia rodunt,
Atque exporrecto trutinantur verba labello,
Ægroti veteris meditantes somnia; gigni
De nihilo nihil, in nihilum nil posse reverti.

Cicero calls him Philosophiæ eversor. Arcesilaus was remarkable for the severity of his criticisms; but knew how to accommodate himself to the age, and pursue the allurements of pleasure. He had a great number of disciples. His doctrines were different in several respects from those of the ancient school; and perhaps he was led into this diversity of opinions by many capital errors in that school, and the incredible arrogance of the dogmatists, who pretended to assign causes for all things; from the mysterious air they had thrown upon the doctrine of ideas; the entirely discarding the testimony of the senses; the objections of the Pyrrhonists, who now began to broach their opinions; and the powerful opposition of the Stoics and Peripatetics, who discovered the feeble parts of the academic philosophy. The middle school, therefore, laid it down as a principle, that we could know nothing, nor even assure ourselves of the certainty of this position; from whence they inferred, that we should affirm nothing, but always suspend our judgment. They insisted that a philosopher was able to dispute upon every subject, and bring conviction with him upon contrary sides of the question. Arcesilaus was succeeded by his disciple Lacydes.

ARCEUIL, a village three miles south of Paris, remarkable for an aqueduct, built in 1624, by Mary de Medicis. See AQUEDUCTS.

ARCEUTHOS, in botany, the juniper tree.

ARCEUTUM is used in some ancient law-writers, for a procuration due to a bishop, abbot, or archdeacon, from their clergy, in time of entertainment.

ARCH′, *v.* & *n.*, AR′CHED, ARCH′LIKE, ARCH′WISE. Lat. *arcus*, a bow. To bow or curve, to form into some circular shape.

Fine devices of *arching* water without spilling, and making it rise in several forms of feathers and drinking glasses, be pretty things to look on, but nothing to health and sweetness. *Bacon.*

Gates of monarchs
Are *arch'd* so high, that giants may get through.
Shakspeare.

I see how thine eye would emulate the diamond; thou hast the right *arched* bent of the brow. *Id.*

The court of *arches*, so called *ab arcuata ecclesia*, or from Bow church, by reason of the steeple or clochier thereof, raised at the top with stone pillars, in fashion of a bow bent *archwise*. *Ayliffe's Parer.*

The proud river, which makes her bed at her feet, is *arched* over with such a curious pile of stones, that considering the rapid course of the deep stream that roars under it, may well take its place among the wonders of the world. *Howell.*

Let the *arched* knife,
Well sharpen'd, now assail the spreading shades
Of vegetables. *Philips.*

The nations of the field and wood
Build on the wave, or *arch* beneath the sand.
Pope.

ARCH, ARCH′LY, ARCH′NESS. Arch, from Gr. αρχος, chief, is a prefix to many words, and its effect is to denote pre-eminence in general. When out of composition it signifies pre-eminence in that which is shrewd, roguish, or waggish.

The tyrannous and bloody act is done;
The most *arch* deed of piteous massacre,
That ever yet this land was guilty of. *Shakspeare.*

There is sprung up
An heretick, an *arch* one, Cranmer. *Id.*

Eugenio set out from the university; he had the reputation of an *arch* lad at school. *Swift.*

John, when his master's knock he heard,
Soon in the dressing-room appeared,
Archly he look'd, and slyly leer'd.
Somerville's Poems.

Arch, in architecture, a concave or hollowed piece of building, constructed in such a manner that the several stones of which it is composed keep one another in their places. The terms arch and vault properly differ only in this, that the arch expresses a narrower, and the vault a broader, piece of the same kind. The principal difference in the form of arches is, that some are circular, and others elliptical; the former having a larger or smaller part of a circle, the other of an ellipsis. What are called straight arches, are those frequently used over doors and windows, the upper and under edges of which are straight and parallel, and the ends and joints all pointing toward a centre. The space between two piers of a bridge is called an arch, because usually arched over. Triumphal arches are magnificent entries into cities, erected to adorn a triumph, and perpetuate the memory of the action. The arches of Titus and Constantine make at this time a great figure among the ruins of old Rome.

Arch, in geometry, any part of the circumference of a circle or curved line lying from one point to another, by which the quantity of the whole circle or line, or some other thing sought after, may be gathered.

Arch of a Circle is a part of the circumference thereof, less than a half, or semicircle.

Arch of Direction, in astrology, a portion of the equator lying between two points in the heavens, one of which is the significator and the other the promissor.

Arch of Progression, in astronomy, is an arch of the ecliptic, which a planet seems to pass over, when its motion is according to the order of the sign.

Arch of Retrogradation is an arch of the ecliptic, described while a planet is retrograde, and moves contrary to the order of the signs.

Arch of Vision is the sun's depth below the horizon, at which a star, before hid in his rays, begins to appear again.

ARCHÆOGRAPHIA, the science or study of antiques, so denominated by Spon, comprehending a knowledge of ancient coins, medals, inscriptions, sculptures, statues, &c.

ARCHAIOLOGY; from *αρχαιος*, ancient, and *λογος*, a discourse; a discourse on antiquity.

ARCHAISM is when either an obsolete word, declension, or conjugation is used: also an unusual and obsolete construction in discourse.

ARCHANGEL, in botany, the English name of the angelica archangelica.

Archangel, according to some divines, meant an angel occupying the eighth rank in the celestial hierarchy. See Angel, and Hierarchy. But others, not without reason, reckon it a title only applicable to our Saviour. Compare Judc 9, with Daniel xii. 1.

Archangel, or Archangelskoe, a government of Russia, containing, with Nova Zembla, 356,400 square miles, and 115,000 inhabitants. The climate is severe, and the country sterile; its principal support is from the fisheries. The wild animals of the forests yield some fur, however, for trade, and the breed of domestic cattle is esteemed. This government contains the eight circles of Archangel, Onega, Cholmegar, Schenkursk, Senega, Kola, Meson, and Kem. Long. 38° 56′ E. lat. 64° 40′ N.

Archangel, in geography, a city of Russia, in the province of Dwina, the capital of the above province, is situated on the east side of the river Dwina, about six miles from the White Sea, 300 north of Moscow, and 400 north-east from Petersburgh. It extends about three miles in length and one in breadth. This city rose from a castle built on the spot by Iwan, or John Basilowitz II. to protect the increasing trade, brought there, by the discovery of the White Sea by the English, and took its name from a monastery built in honor of the archangel Michael. Before this period the commercial intercourse between Russia and the northern parts of Europe had been carried on by the Hanseatic towns. The ships usually sailed to Revel or Narva, and from thence passed through Dorpt to Plescof and Novogorod, where their factories were established. The discovery of Archangel, in 1553, deprived the Hanseatic towns of a great part of this commerce, and transferred it to the English. On the 11th of May, that year, three ships sailed from Deptford, to explore the northern seas, under the command of Sir Hugh Willoughby. Two of these vessels penetrated as high as the seventy-second degree of latitude, to the coast of Spitzbergen; and being afterwards forced by stress of weather into the bay of the river Arzina in Russian Lapland, both their crews were frozen to death. Richard Chancellor, who commanded the other ship, called the Bonaventure, discovering the country bordering upon the White Sea, landed near the mouth of the Dwina, in a bay, which he denominated the Bay of St. Nicholas from a convent of that name, near the present port of Archangel. The czar being informed of his arrival, invited him to his court, entertained him hospitably, and indulged the English with a free trade in his dominions. In consequence of this permission, a company of merchants was incorporated in London; and being encouraged by particular privileges from the czar, set on foot a considerable commerce, to the mutual advantage of both nations. This traffic the English for some time enjoyed without competition. The Dutch, however, and other nations, gradually insinuated themselves into it, and carried it on at a very great disadvantage, not being favored with those privileges which the czar had granted to the English company. These were at last suddenly annihilated by Alexis Michaelowitz; who, in 1648, banished the English merchants from all his dominions. The cause of this expulsion was imputed to the resentment which the czar felt against the English for the execution of Charles I. with whom he was closely connected by leagues of amity and alliance: but in fact he abolished the company's privileges the year before that event; and his indignation against the English for their rebellion was only a political pretext; the real motive being derived from the offers made by the Dutch to pay duties of export and import to the amount

of 15 per cent. if they were indulged with the liberty of carrying on as free a trade as the English throughout his dominions. For not long afterwards the czar suffered William Prideaux, Cromwell's agent, to reside at Archangel; and permitted the English to renew their commerce in that port upon the same footing with other foreigners. And upon this footing alone our merchants ever after continued to trade. The commodities chiefly imported into Archangel were, gold and silver stuffs and laces, gold wire, cochineal, indigo and other drugs for dyeing, wine, brandy, and other distilled spirits. The customs arising to the czar were computed at 200,000 rubles a-year, and the number of foreign ships at 400 annually. But upon the building of Petersburgh, Peter the Great abolished the immunities of Archangel, and removed the commerce of the White Sea to the havens of the Baltic. Still, however, its exports of tar were considerable; in 1730 to the amount of 40,000 lasts, of eleven barrels each. In 1752 Elizabeth again restored the ancient immunities of Archangel; and its present trade is not inconsiderable. It now contains about 1200 houses, for the most part of wood, of which, strange to say, the pavement sometimes is composed. As a place of commerce it is much frequented by all nations, but in particular by the English, the Dutch, and the inhabitants of Bremen and Hamburgh. A large stone building is destined for the reception of such foreign goods as would be in danger of fire. But it has never regained the prosperity which it enjoyed during the latter half of the seventeenth century. There is an imperial dock-yard, and ships of war were built here formerly. Archangel is the chief deposit of foreign articles destined for Siberia. The foreign vessels come round the North Cape in June or July, and remain at Archangel till September or October. During this interval is held the great market, in which train oil, tallow, tar, linseed, furs, wax, iron, and coarse linen, are exposed to sale, chiefly for the accommodation of foreigners. A considerable number of large vessels of this port trade to Holland and England; and about sixty smaller ones are employed in the fisheries. Upwards of 100 foreign ships enter the port yearly; but the harbour is very inconvenient, and even dangerous, through an extensive sand bank, with only twelve feet and a half of water. There are here eleven Russian churches, one Lutheran, and one Calvinist. Population, in its flourishing state, 30,000; at present, from 5000 to 7000.

ARCHANGELICÆ, in entomology, a species of aphis, found on the plant angelica archangelica, and described by Scopoli.

ARCHARD, in commerce, a kind of green fruit, pickled in vinegar, much valued throughout the East Indies. The best are those brought from Persia, in bottles, much like small cucumbers among us.

ARCHASIA, or ARCHESIA, in entomology, a species of papilio found in Java.

ARCHBISHOP; a bishop of the first class, who superintends the conduct of other bishops in his suffragans. Archbishops were not known in the east till abo the year 320; and though there were some soon after this who had the title, yet that was only a personal honor, by which the bishops of considerable cities were distinguished. It was not till later that archbishops became metropolitans, and had suffragans under them. Athanasius appears to be the first who used the title Archbishop, which he gave occasionally to his predecessor. Gregory Nazianzen, in like manner, gave it to Athanasius; not that either of them were entitled to any jurisdiction, or even any precedence in virtue of it. Among the Latins, Isidore Hispalensis is the first that speaks of archbishops. He distinguishes four orders or degrees in the ecclesiastical hierarchy, viz. patriarchs, archbishops, metropolitans, and bishops. The archbishop, besides the inspection of the bishops and inferior clergy in the province over which he presides, exercises episcopal jurisdiction in his own diocese. He is guardian of the spiritualities of any vacant see in his province, as the king is of the temporalities, and exercises ecclesiastical jurisdiction in it. He is entitled to present by lapse to all the ecclesiastical livings in the disposal of his diocesan bishop, if not filled within six months. He has likewise a customary prerogative, upon consecrating a bishop, to name a clerk or chaplain to be provided for by such bishop; in lieu of which it is now usual to accept an option. He is said to be enthroned when vested in the archbishopric; whereas bishops are said to be installed.

The ecclesiastical government of England is divided into two provinces, viz. Canterbury and York. Canterbury has the following suffragan bishoprics appertaining to it, St. Asaph, Bangor, Bath and Wells, Bristol, Chichester, Lichfield and Coventry, St. Davids, Ely, Exeter, Gloucester, Hereford, Landaff, Lincoln, London, Norwich, Oxford, Peterborough, Rochester, Salisbury, Winchester, and Worcester. To York appertain the bishoprics of Carlisle, Chester, and Durham; to which may be added the bishopric of Sodor and Man, whose bishop is not a lord of Parliament. See CANTERBURY and YORK. The archbishop of Canterbury had anciently, viz. till the year 1152, jurisdiction over Ireland as well as England, and was styled a patriarch, and sometimes alterius orbis papa, and orbis Britannici pontifex. Matters were recorded in his name thus: Anno pontificatus nostri primo, &c. The first archbishop of Canterbury was Austin, appointed by king Ethelbert, on his conversion to Christianity, about the year 598. He was also legatus natus. He even enjoyed some special marks of royalty; as, to be patron of a bishopric, which he was of Rochester; and to make knights, coin monies, &c. He is still the first peer of England, and the next to the royal family; having precedence of all dukes and all great officers of the crown. It is his privilege, by custom, to crown the kings and queens of this kingdom. He may retain and qualify eight chaplains, whereas a duke is by statute allowed only six. He has, by common law, the power of probate of wills and testaments, and granting letters of administration. He has also a power to grant licences and dispensations in all cases formerly sued for in the court of Rome, and not repugnant to the law of God. He accordingly issues special licences to marry, to hold two

livings, &c. and to exercise the right of conferring degrees He also holds several courts of judicature; as, court of arches, court of audience, prerogative court, and court of peculiars. He is addressed with the title of Grace, and most Reverend Father in God; and writes himself by Divine Providence; whereas bishops only use by Divine Permission. The archbishop of York has the like rights in his province as the archbishop of Canterbury. He has precedence of all dukes not of the royal blood; and of all officers of state, except the lord high chancellor. The first archbishop of York was Paulinus, appointed by Pope Gregory about the year 622. He had formerly jurisdiction over the bishops of Scotland; but in 1470 pope Sextus IV. created the bishop of St Andrews archbishop and metropolitan of all Scotland.

Whilst episcopacy prevailed in Scotland it had two archbishops, i. e. of St. Andrew's and Glasgow; of which the former was accounted the metropolitan. Even before it arrived at the dignity of an archbishopric, this see resisted with great spirit all the attempts of the archbishops of York in England to become the metropolitans of Scotland. The sees of Argyle, Galloway, and the Isles, were suffragans to Glasgow; all the others in the kingdom to St. Andrews. Ireland has four archbishops, i. e. of Armagh, Dublin, Cashel, and Tuam; of whom the former is primate of all Ireland.

ARCH-BUTLER, one of the great officers of the German empire, who presents the first cup to the emperor on solemn occasions.

ARCH-CHAMBERLAIN, an officer of the empire; the same with the great chamberlain of England. The elector of Brandenburgh was appointed arch-chamberlain of the empire by the golden bull; and he bears the sceptre before the emperor, walking on the left hand of the elector of Saxony. At some solemnities he also serves on horseback like other electors, carrying a basin with a towel in his hands; which, alighting, he sets for the emperor to wash.

ARCH-CHANCELLOR, a high officer who, in ancient times, presided over the secretaries of courts. Under the two first races of the kings of France, when their territories were divided into Germany, Italy, and Arles, there were three arch-chancellors: and hence the three arch-chancellors still subsisting in Germany; the archbishop of Mentz being arch-chancellor of Germany, the archbishop of Cologn of Italy, and the archbishop of Treves of Arles.

ARCH-COUNT, a title formerly given to the earl of Flanders, on account of his great power and riches.

ARCH-DAPIFER; from *αρχος*, and dapifer, sewer; the chief sewer, a principal officer of the empire of Germany, whose business it is, upon solemn festivals, to see that the dishes be properly placed on the imperial table. This office belongs to the Elector, now king, of Bavaria, but was formerly claimed by the Count Palatine of the Rhine.

ARCHDEACON, one who supplies the bishop's place and office in such matters as do belong to the episcopal function. The law styles him the bishop's vicar or vicegerent.

An archdeacon is next to a bishop. His jurisdiction extends either over the whole diocese or a part of it. He is usually appointed by the bishop himself; and hath a kind of episcopal authority, originally derived from the bishop, but now independent and distinct from his. He therefore visits the clergy; and has his separate court for punishment of offenders by spiritual censures, and for hearing all other causes of ecclesiastical cognizance. There are sixty archdeacons in England

ARCHDEACON'S COURT is the lowest court in the whole ecclesiastial polity. It is held, in the archdeacon's absence, before a judge appointed by himself, and called his official; and its jurisdiction is sometimes in concurrence with, sometimes in exclusion of, the bishop's court of the diocese. From hence, however, by statute 24 Hen. VIII. c. 12, there lies an appeal to the bishop.

ARCHDRUID, the chief or pontiff of the ancient druids of a nation. See DRUID.

ARCHDUKE, a title given to some sovereign princes, as of Austria and Tuscany. The word is more correctly defined by Chambers, to be 'a duke vested with some quality, pre-eminence, and authority, above other dukes.' The archduke of Austria is a very ancient title. There have also formerly been archdukes of Lorraine and Brabant.

ARCHED LEGS, an imperfection in a horse, when, being in his natural position, he has his legs bent forwards; so that his whole leg makes a kind of arch or bow. This usually arises from excessive labor, whereby the back sinews are made to shrink up, so that the legs remain arched and naturally tremble after a little riding; though the disorder is natural to some horses.

ARCHED SKENE, or SCHEME, in architecture is used to denote a flat arch, less than a semicircular one.

ARCHELAUS, a celebrated Greek philosopher, a disciple of Anaxagoras, flourished about 440 years before Christ. He read lectures at Athens, and did not depart much from the opinions of his master. He taught that there was a double principle of all things, namely, the expansion and condensation of the air, which he regarded as infinite. Heat, according to him was in a continual motion. Cold was ever at rest. The earth, which was placed in the midst of the universe, had no motion. It originally resembled a wet marsh, but was afterwards dried up; and its figure, he said, resembled that of an egg. Animals were produced from the heat of the earth, and even men were formed in the same manner. All animals have a soul, which is born with them; but the capacities of which vary according to the structure of the organs of the body in which it resides. Socrates, the most illustrious of his disciples, was his successor.

ARCHELAUS, king of Macedon, was the natural son of Perdiccas II. and succeeded him after murdering Alcetas, Perdiccas's brother. He greatly strengthened his kingdom, and he was a liberal encourager of literature and the arts. He entertained Euripides at his court, and employed the pencil of Zeuxis to ornament his palace. He died about A. A. C. 398.

ARCHELAUS, a son of Herod the Great, by *Malthace* his fifth wife. He was thought the most cruel and bloody of his father's children. Herod having put to death Alexander, Aristobulus, and Antipater, and deprived Herod Antipas of his claim to the kingdom, he appointed Archelaus his successor, if the emperor agreed to it. At Herod's death, when this was made known to the people, they seemed pleased and promised allegiance. Archelaus interred his father with great pomp, made a solemn mourning for seven days, and gave the people a splendid entertainment. Having convened them in the court of the temple, he assured them of his mild government; and that he would not assume the royal *title till* he was confirmed by the emperor. Immediately after (A. D. 1.) a tumultuous assembly of the people required him to execute the man who had advised his father to kill a noted zealot for pulling down the golden eagle from the gate of the temple; at the same time demanding that Joazas should be divested of the priesthood, and loading the memory of his father Herod with bitter curses and reproaches. Provoked at this insult, he ordered his troops to fall upon them, and 3000 of them were killed on the spot. After *this he* went to Rome, to get himself confirmed in the kingdom; but his brother Herod Antipas opposed him, insisting on a former will of his father's, constituting him his successor. In consequence of which Augustus delayed giving an answer. The Jewish nation petitioned the emperor to set aside the whole family of Herod, and constitute them into a Roman province, subject to the governor of Syria: Archelaus opposed the petition; and the emperor deferred giving judgment. But a few days after he assigned *Archelaus* a part of his father's kingdom, with the title of Ethnarch, and promised him the crown if his conduct should merit it. Upon his return to Judea he deposed Joazas the high-priest, and made Eleazer, his brother, priest in his stead. When Archelaus had governed about seven years in the most violent and tyrannical manner, the Jews and Samaritans jointly accused him to the emperor, who sent for him to Rome; and after hearing him, banished him to Vienne in Gaul, where he died. Alstedius and others say he reigned nine years. To avoid the fury of this monster, Joseph and Mary retired to Nazareth.

ARCHELAUS, the son of Apollonius, one of the greatest sculptors of antiquity, was a native of Ionia, and is thought to have lived in the time of the emperor Claudius. He executed, in marble, the apotheosis of Homer. This masterpiece in sculpture was found in 1568, in a place named Fratocchia, belonging to the princes of Colonna, where, it is said, the emperor Claudius had a pleasure-house. Father Kircher, Cupert, Spanheim, and several other learned antiquaries, have given a description and explication of this work.

ARCHELOUS, in ancient geography, now Aspressdamo, a river of Greece, which having its source in Mount Pindus, and passing the gulf of Arta to the south, between the ancient Ætolia and Acarnania, entered the Ionian Sea.

ARCHEMY is used by some to denote the art of transmuting less perfect metals into the more perfect. In which sense archemy differs from alchemy, as a part from the whole.

ARCHENDA, in the ancient physic, a kind of powder prepared of alcanna, and leaves of the Egyptian ligustrum, wherewith the people smeared their feet after bathing.

ARCH'ER, ARCH'ERESS, ARCH'ERY. } Lat. *arcus*, a bow; Fr *archer*, one that shoots with a bow

Flowers of this purple dye,
Hit with Cupid's *archery*,
Sink in apple of his eye!
Shakspeare. Midsummer Night's Dream.

Draw, *archers*, draw your arrows to the head. *Id.*

This Cupid is no longer an *archer*; his glory shall be ours; for we are the only love-gods. *Id.*

Thou frequent bring'st the smitten deer;
For seldom, *archers* say, thy arrows err. *Prior.*

Among the English artillery, *archery* challengeth the pre-eminence, as peculiar to our nation. *Camden.*

Blest seraphims shall leave their quire,
And turn love's soldiers upon thee,
To exercise their *archery*.
Crashaw's Steps to the Temple.

Say, from what golden quivers of the sky
Do all thy winged arrows fly?
Swiftness and power by birth are thine.
'Tis (I believe) this *archery* to shew,
That so much cost in colors thou,
And skill in painting, dost bestow
Upon thy ancient arms, the gaudy heavenly bow.
Cowley

ARCHERS, in France, under the old monarchy, the officers who attended the lieutenants de police and provosts to make captures, seizures, arrests, &c. They were called archers, though their arms were only halberds or carabines. In this sense they had archers of the grand prevot de l'hotel; of the prevot des marchands; city archers; archers du guet, or of the watch, &c. Small parties of archers, called also gens de marechausse, continually patroled on the great roads, to secure them against robbers. The carriages of Lyons, &c. were always escorted by a party of archers. To the diligence of these archers it was chiefly owing, that persons travelled in all parts of France in the utmost security; there being fewer robberies on the highway in that whole kingdom in a year, than about London in a week.

ARCHERY is the art or exercise of shooting with a bow and arrow. The origin of this pursuit is involved in obscurity; but, according to the fanciful opinion of the poet Claudian, originated with the porcupine, which was observed to cast its quills whenever it was offended. There are many fictitious accounts respecting its early rise. Apollo, according to Plato, Galen, and Callimachus, was the inventor of it; and Isidorus remarks that Apollo communicated it to the Cretans. Some few of the modern fictions have equalled the ancients in genuine absurdity; particularly when the bow and arrow was affirmed to be the instruments with which Cain was killed by Lamech. In Genesis the primary mention of archery occurs, when Ishmael, the natural son of Abraham, is said to have 'dwelt in the wilderness, and become an archer.' The Jews, however, were less successful in this art than the neighbouring nations. David,

accession to the throne, was, by this national inexperience, induced to issue an order that Judah, the most military tribe, should practise archery. Jonathan, the son of Saul, is reported to have been the most skilful archer of all the Jews. There are also certain passages in the Old Testament, which evince that archery was not only a military pursuit, but engaged in as an innocent pastime, and as the means of divination.

The Persian archers have been celebrated for their skill; they were usually placed in the rear of the *αχοντισται*, spearmen; and these were behind the *θωρακοφοροι*. But, according to Herodotus, the Scythians were superior to all other nations. If we may use the authority of Homer, in his military delineations, we should observe that the Greek archers were promiscuously interspersed among their armies in battle, and took their aim with deliberation and success.

In after periods it seems that the archers formed part of the *ψιλοι*, or light armed troops, who were considered inferior to the *οπλιται*. To the practice of archery, the Athenians owed, in a great measure, their victories; and particularly over the Lacedæmonians, in the vicinity of Pylos. Athens was guarded by archers, which was more externally requisite than internally judicious. In the age of Scipio Africanus, archery was used in the Numantian contest. Tiberius also conquered Inguominus and Arminius, principally with the assistance of his equestrian and pedestrian archers. After his time the practice was, in a great degree, discontinued; although, according to Herodian and Suetonius, the emperors Domitian and Commodus were expert bowmen. The Roman sagittarii, or arrow-bearers, formed part of the Velites, which consisted of juvenes and pauperes, and occasionally of allies. Their situation in battle was hazardous, being sometimes placed in the front, sometimes on the right and left wing, and sometimes in the rear; they were chiefly employed, previous to the commencement of the several attacks, in harassing the weakest quarters of the enemy. The Parthians were singular in their archery, and always kept up a running fight, discharging their arrows in their retreat. The Goths, Huns, and Vandals acquired much celebrity in archery; but previous to the Saxon invasion, the practice seems to have been unknown in Britain; Ossian's heroes frequently used the bow. In this island archery was greatly encouraged in former times, and many statutes were made for the regulation thereof; whence the English archers became the best in Europe, and obtained many signal victories. The Artillery Company of London, though they have long disused the weapon, are the remains of the ancient bowmen or archers. Artillery (artillérie) is a French term signifying archery; as the king's bowyer was in that language styled artillier du roy. And from that nation the English seem to have learnt at least the cross-bow archery. William the Conqueror had a considerable number of bowmen in his army at the battle of Hastings, when no mention is made of such troops on the side of Harold. And it is supposed that these Norman archers shot with the arbalist or cross-bow, in which formerly the arrow was placed in a groove, termed in French a quadrel, and in English a bolt. Of the time when shooting with the long-bow first began among the English, there appears no certain accounts. Their chronicles do not mention the use of archery till the death of Richard I. who in 1199 was killed by an arrow at the siege of Limoges in Guienne, which Hemmingford mentions to have issued from a cross-bow. After this, there appears no notice of archery for nearly 150 years, when an order was issued by Edward III. in the fifteenth year of his reign, to the sheriffs of most of the English counties for providing 500 white bows, and 500 bundles of arrows, for the then intended war against France. Similar orders were repeated in the following years, with this difference only, that the sheriff of Gloucestershire is directed to furnish 500 painted bows, as well as the same number of white. The famous battle of Cressy was fought four years afterwards, in which our chroniclers state that we had 2000 archers who were opposed to about the same number of French, together with a circumstance which seems to prove, that by this time we used the long bow, whilst the French archers shot with the arbalist. Previously to the engagement there fell a very heavy rain, which is said to have damaged the bows of the French, or perhaps rather the strings of them. Now the long-bow when unstrung, may be most conveniently covered, so as to prevent the rain from injuring it; nor is there hardly any addition to the weight from such a case; whereas the arbalist is of a most inconvenient form to be sheltered from the weather. As therefore, in 1342, orders were issued to the sheriffs of each county to provide 500 bows, with a proper proportion of arrows, it seems probable that these were long bows and not the arbalist. At this battle the English ascribed their victory chiefly to the archers. The battle of Poictiers was fought A. D. 1356, and gained by the same means. Sometimes the archers gained great victories without the least assistance from the men at arms; as, particularly the decisive victory over the Scots at Hamilton, A. D. 1402. In that bloody battle, the men at arms did not strike a stroke, but were mere spectators of the valor and victory of the archers. The earl of Douglas, who commanded the Scotch army in that action, enraged to see his men falling thick around him by showers of arrows, and trusting to the goodness of his armour, which had been three years in making, accompanied by about eighty lords, knights, and gentlemen, in complete armour, rushed forward and attacked the English archers sword in hand. But he soon had reason to repent his rashness. The English arrows were so sharp and strong, and discharged with so much force, that no armour could repel them. The earl of Douglas, after receiving five wounds, was made prisoner; and all his brave companions were either killed or taken. Philip de Comines acknowledges, what our own writers assert, that the English archers excelled those of every other nation; and Sir John Fortesque says again and again, that 'the might of the realme of England standyth upon archers.' The superior dexterity of their archers gave the English a great advantage over their capital enemies the French and Scots. The French depended chiefly on their men at arms,

and the Scots on their pikemen; but the ranks of both were often thinned and thrown into disorder by flights of arrows before they could reach their enemies. James I. of Scotland, who had seen and admired the dexterity of the English archers, and who was himself an excellent archer, endeavoured to revive the exercise of archery, among his own subjects, by whom it had been too much neglected. With this view, he ridiculed their awkward manner of handling their bows, in his humorous poem of Christ's Kirk on the Green; and procured the following law to be made in his first parliament, A. D. 1424, immediately after his return to Scotland: 'That all men might busk thame to be archares, *fra the* be twelve years of age; and that at ilk ten punds worth of land, thair be made bow markes, and specialle near paroche kirks, quhairn upon halie days men may cum, and at the leist schute thryse about, and have usage of archarie; and whasa usis not archarie, the laird of the land sall rais of him a wedder; and giff the laird raisis not the said pane, the king's shiref or his ministers sall rais it to the king.' But the untimely death of that excellent prince prevented the effectual execution of this law. In 1417, *Henry* V. ascribes his victory at Agincourt to the archers, and directs the sheriffs of many counties to pluck from every goose six wing *feathers*, for the purpose of improving arrows, which are to be paid for by the king. In 1421, though the French had been defeated, both at Cressy, Poictiers, and Agincourt, by the English archers, yet they still continued the use of the cross-bow; for which reason, Henry V. as duke of Normandy, confirmed the charters of the balistarii, which had been long established as a fra*ternity in* Rouen. In the fifth of Edward IV. an act passed, that every Englishman, and Irishman dwelling with Englishmen, shall have an *English* bow of his own height, which is directed to be made of yew, wych, hazel, ash, or auburne, or any other reasonable tree, according to their power. The next chapter also directs, that butts shall be made in every township, which the inhabitants are obliged to shoot up and down every last day, under the penalty of a half-penny when they should omit this exercise. In the fourteenth year *of this* king, it appears by Rymer's Fœdera, that 1000 archers were to be sent to the duke of Burgundy, whose pay was settled at sixpence a day. This circumstance proves very strongly, the great estimation in which archers were still held. In the same year, Edward, preparing for war with France, directs the sheriffs to procure bows and arrows, as most specially requisite and necessary. On the war taking place with Scotland eight years after this, Edward provided both ordnance and archers; so, that though the *art of artillery*, as we now term it, was then gaining ground, yet that of the bow and arrow was not neglected. Richard III. by his attention to archery, was able to send 1000 bow-men to the duke of Bretagne, and he availed himself of the same troops at the battle of Bosworth. During the time of Henry VII. there appears no matter relative to gunpowder or artillery; but in 1488 he directed a large levy of archers to be sent to Britany, and that they should be reviewed before they embarked. In the nineteenth year of his reign, this king forbad the use of the cross-bow; because the long bow had been much used in this realm, whereby honor and victory had been gotten against outward enemies, and the realm greatly defended, &c. In the reign of Henry VIII. several statutes were made for the promotion of archery. The eighth Eliz. c. 10. regulates the price of bows, and the thirteenth Eliz. c. 14. enacts, that bow staves shall be brought into the realm from the Hanse towns and the eastward; so that archery still continued to be an object of attention. In Rymer's Fœdera, there is neither statute nor proclamation of James I. on this head; but it appears by Dr. Birch's Life of his son, prince Henry, that at eight years of age he learned to shoot both with the bow and gun, whilst, at the same time, this prince had in his establishment an officer who was styled bow-bearer. The king granted a second charter to the artillery company, by which the powers they had received from Henry VIII. were considerably extended. Charles I. appears from the dedication of a treatise entitled the Bowman's Glory, to have been himself an archer; and, in the eighth year of his reign, he issued a commission to the chancellor, lord mayor, and several of the privy council, to prevent the fields near London being so inclosed, as to interrupt the necessary and profitable exercise of shooting; as also to lower the mounds where they prevented the view from one mark to another. Catharine of Portugal, queen to Charles II. seems to have been much pleased with the sight, at least, of this exercise; for in 1676, by the contributions of Sir Edward Hungerford and others, a silver badge for the marshal of the fraternity was made, weighing twenty-five ounces, and representing an archer drawing the long-bow to his ear, with the following inscription: 'Reginæ Catharinæ Sagittarii.' The supporters are two bowmen, with the arms of England and Portugal. In 1682 there was a most magnificent cavalcade and entertainment given by the Finsbury archers, when they bestowed the titles of duke of Shoreditch, marquis of Islington, &c., upon the most deserving. Charles II. was present, but the day being rainy, he was obliged soon to leave the field. So lately as 1753, targets were erected in the Finsbury fields during the Easter and Whitsun holidays, when the best shooter was styled captain for the ensuing year, and the second, lieutenant. Though archery continued to be encouraged by the king and legislature, for more than two centuries after the first knowledge of the effects of gunpowder, yet by the end of the reign of Henry VIII. it seems to have been partly considered as a pastime. Arthur, the elder brother of Henry, is said to have been fond of this exercise, inso much that a good shooter was styled Prince Arthur. We are also informed, that he pitched his tent at Mile-end, to be present at this recreation, and that Henry his brother attended. When the latter became king, he gave a prize at Windsor to those who should excel in this exercise; and a capital shot having been made, Henry said to Barlow, one of his guards, 'If you still win, you shall be duke over all archers'

Barlow, therefore, having succeeded, and living in Shoreditch, was created duke thereof. Upon another occasion, Henry and the queen were met by 200 archers on Shooter's-hill, which probably took its name from their assembling near it to shoot at marks. This king likewise gave the first charter to the Artillery Company, in the 29th year of his reign, by which they are permitted to wear dresses of any color, except purple and scarlet, to shoot not only at marks, but birds, if not pheasants or herons, and within two miles of the royal palaces. They are also enjoined, by the same charter, not to wear furs of a greater price than those of the marten. The most material privilege, however, is that of indemnification from murder, if any person passing between the shooter and the mark is killed, provided the archers have first called out 'fast.' The long bow, however, maintained its place in our armies long after the invention of fire arms. Nor have there been wanting experienced soldiers who were advocates for its continuance, and who in many cases, even preferred it to the harquebuss, or musket. King Charles I. twice granted special commissions under the great seal, for enforcing the use of the long bow. The first was in the fourth year of his reign; but this was revoked by proclamation, four years afterwards, on account of divers extortions and abuses committed under sanction thereof. The second, in 1633, in the ninth year of his reign, to William Meade and his son, also named William, wherein the former is styled an ancient archer, who had presented to the king a warlike invention for uniting the use of the pike and bow, seen and approved by him and his council of war; wherefore his majesty had granted them a commission to teach and exercise his loving subjects in the said invention, which he particularly recommended the chief officers of his trained bands to learn and practise; and the justices and other chief magistrates throughout England are therein enjoined to use every means in their power to assist Meade, his son, and all persons authorised by them in the furtherance, propagation, and practice of this useful invention. Both the commissions and proclamation are printed at large in Rymer. At the breaking out of the civil war the earl of Essex issued a precept, dated Nov. 1643, for stirring up all well affected people by benevolence, towards the raising a company of archers for the service of the king and parliament. Since this period it has fallen, as an implement of warfare, into gradual and entire disuse.

This, however, was not without a struggle on the part of its advocates. Hollingshed laments the decay of it: 'now,' says he, 'we have in a manner generally given over that kind of artillery, and for long bows indeed do practice to shoot compass' for our pastime. Cutes the Frenchman, and Rutters deriding our new archery in respect to their corslets, will not let in open skirmish, if any leisure serve, to turn up their tails and cry, 'shoot, Englishmen,' and all because our strong shooting is decayed and laid in bed. But if some of our Englishmen now lived that served king Edward III. the breech of such a varlet should have been nailed to his bum with an arrow, and another fastened in his bowels,' &c. Chron. v. i. p. 198. Bishop Latimer introduces a curious expostulation on the same subject in his sixth sermon. 'The art of shutynge hath ben in tymes past much esteemed in this realme; it is a gyft of God that he hath given us to excell all other nacions wythall. It hath been Goddes instrumente whereby he hath gyven us manye victories agaynste oure enemies. But nowe we have taken up horynge in townes insteede of shutynge in the fyeldes. I desire you, my Lordes, even as you love honoure and glorye of God, and intend to remove his indignacion, let there be sent fourth some proclimacion some sharpe proclamacion to the justices of peace, for they do not theyre dutye. Charge them upon their allegiance that thys singular benefit of God may be practised; and that it be not turned into bollying and glossying and horing wythin the townes; for they be negligente in executing their lawes of shutynge.'

An arrow weighing from twenty to twenty-four dwts. weight, made of yew, was considered by archers to be the best that could be made. The feathers of a goose should be used; and the bird from which they are taken should be two or three years of age. In an arrow, it is remarkable that two out of three feathers are commonly white; as they are plucked from the gander, but the third is usually brown or gray, being taken from the goose; and this difference of color shows the archer when the arrow is properly placed. The expression of the 'gray goose's wing,' in the old ballad of Chevy Chase, is in allusion to this occurrence. Originally arrows were armed with flint or metal heads; latterly with iron of different forms and names. Henry IV. ordained that all arrows should be well boiled or brased, and hardened at the points with steel. Arrows were usually reckoned by sheaves; a sheaf consisting of twenty-four arrows. They were carried in a quiver, called an arrow-case, which served for the magazine. In ancient times, different species of combustible materials were attached to the heads of arrows, and shot from long bows; and even subsequent to the invention of gunpowder, this mode has been carried into execution. According to Neade, an archer may shoot an ounce of fire-works from an arrow, twelve score yards. Among the stores at Berwick and Newhaven, in the reign of Edward VI. arrows with wild-fire; and arrows with fire-works are enumerated. Some slight opinion of the strength of an arrow in its flight, may be formed from the account given by Edward VI. in his journal: he observes, that '100 archers shot arrows each before him and afterwards altogether; that they shot at an inch board: some pierced it through and stuck in the other board, and others pierced it through with the heads of their arrows. There is a curious account of an archer in the poems of Chaucer, and as it is very appropriate on the present occasion, we shall make no apology for the insertion:

And he was clade in cote and hode of grene,
A sheaf of peacocke arrowes bright and keen
Under his belt he bare full thriftily:
Well coude he dresse his takel yemanly;

His arwes drouped not with fethers lowe,
And in his hande he bare a mighty bowe;
A not hed hadde he; with a browne visage
Of woodcraft coude he well all the usage.
Upon his arms he had a gaie bracer,
And by his side a sword and a bokeler;
And on the other side he had a gaie daggere,
Harneised wel, and sharp as point of spere;
A cristofre on his breast of silver shene,
A horn he bare, the baudrik was of grene.

In a curious manuscript of the time of queen Elizabeth, is this account of an archer and all his necessary appendages: 'Captains and officers should be skilful of that most noble weapon, and see that their soldiers, according to their draught and strength, have good bows, well notched, well strynged, every strynge whippe in their noche; and in the myddes rubbed with wax, braser, and shuting glove; some spare strynges trymed as aforesaid; every man one shefe of arrows, with a case of leather defensible against the rayne; and in the same fower and twentie arrowes, whereof eight of them should be lighter than the residue; to gall or astoyne the enemye with the hail-shot of light arrows; before they shall come within the danger of the harquebuss-shot. Let every man have a brigandine, or a little cote of plate, a skull, or huskyn, a mawle of leade of five foote in lengthe, and a fusee, and the same hanging by his girdle, with a hook and a dagger; being thus furnished, teach them by musters to marche, shoote, and retire, keeping their faces upon the enemy's. Sum tyme put them into great nowmbers, as to battle appertayneth; and thus use them oftentimes practised, till they be perfecte; for those men in battel or skirmish cannot be spared. None other weapone maye compare with the same noble weapon.'

The Genoese and the Flanderkins occasionally resort to the exercise of the long bow. In the formation of their bows, the Laplanders are reported to evince great ingenuity. Their usual custom is to flatten two pieces of hard wood and join them by a very tenacious glue. In a similar mode the North Americans construct their bows of three several pieces, and strengthen them with the sinews of the deer, which, when prepared, they wrap carefully round the thickest part of the bow.

The Royal Company of Archers in Scotland are said to owe their origin to the commissioners, who were originally appointed by James I. to superintend and regulate the exercise of archery throughout the kingdom. These commissioners, who were generally people of character and respectability, picked out, among the number of men under their superintendence, the most expert archers; and, in cases of emergency, made a present of their services to the government, in order that they might form the king's body-guard. While in this situation they gave repeated instances of their courage and dexterity. Within seven miles of Edinburgh, the royal company still claim the rank of the king's chief body-guards. In the year 1677 this company was known under the name and title of His Majesty's Company of Archers; and in the same year, and by the same act of the privy council, a piece of plate of the value of twenty pounds was shot for at the annual parades of the company, called weapon shawings; this plate was denominated the 'king's prize.' At the period to which we are at present alluding, the royal company consisted of the principal nobility of Scotland. But the revolutionary principles to which they so tenaciously adhered, almost annihilated their consequence, and withheld the continuance of the king's prize. Their original magnificence was, however, revived on the accession of queen Anne to the throne; but their attachment to the unfortunate and ill-treated house of Stuart, again proved the declension of their splendor. But these differences, by the annihilation of the family to whom they are attached, have now subsided, and they are now reinstated in all their former consequence. In 1788 the annual prize was revived and shot for, in the presence of a numerous body of spectators. We may here observe, that the three principal bodies of archers in England and Scotland are now incorporated in one; by the union of the woodmen of Arden, the Toxopholites, and the Royal Society of Archers. The prizes, which properly belong to the latter, and which are annually shot for; are, 1st. A silver arrow, which was presented by the town of Musselburgh, which seems to have been shot for as far back as the year 1603. Whoever gains this may take charge of it for a year, at the expiration of which period it is returned with any device that his imagination may suggest. 2. A silver arrow, which, in A. D. 1626, was granted by the town of Peebles. 3. A silver arrow given by the town of Edinburgh, A. D. 1709. 4. A silver punch-bowl, about the value of fifty pounds, made at the expense of the company of Scotch silversmiths. 5. The king's prize, which is the entire property of the winner. These prizes are shot for at what is called rovers: the marks are placed at the distance of 185 yards. The uniform of the Royal Company of Archers is tartan, lined with white, and trimmed with green and white fringes; a white sash, with green tassels, and a blue bonnet, with St. Andrew's feather and cross. They have also two standards, on one of which is inscribed, 'Nemo me impune lacessat;' on the other, 'Dulce pro patriâ periculum.'

ARCHERY, in our ancient customs, was a service of keeping a bow for the use of the lord to defend his castle

ARCHES, in heraldry, are borne in coat-armour, both double and single; and they are drawn as springing from, or supported by, pillars as represented in the annexed diagram.

ARCHES-COURT; from arches and court; the chief and most ancient consistory that belongs to the archbishop of Canterbury, for the debating of spiritual causes, so called from Bow-church in London, where it is kept, whose top is raised of stone pillars, built archways. The judge of this court is termed the dean of the arches, or official of the arches-court; dean of the arches, because with this office is commonly joined a peculiar jurisdiction of thirteen parishes in London, termed a deanery, being exempted from the

authority of the bishop of London, and belonging to the archbishop of Canterbury; of which the parish of Bow is one. Some others say, that he was first called dean of the arches, because the official to the archbishop; the dean of the arches was his substitute in his court, and by that means the names became confounded. The jurisdiction of this judge is ordinary, and extends through the whole province of Canterbury; so that upon any appeal, he forthwith and without any farther examination of the cause, sends out his citation to the party appealed, and his inhibition to the judge from whom the appeal is made. It is proper to add, that from this court there lies an appeal to the king in chancery, that is, to a court of delegates appointed under the king's great seal, by stat. 25 Henry VIII. c. 19, as supreme head of the English church, in the place of the bishop of Rome, who formerly exercised that jurisdiction; which circumstance alone will furnish the reason why the Popish clergy were so anxious to separate the spiritual court from the temporal.

AR'CHETYPE, } Αρχετυπος, *archetypus*;
AR'CHETYPAL. } from αρχη, chief, and τυπος, form. 'A principal type, figure, form; the chief pattern, mould, model, example, or sample, whereby a thing is framed; an authentic or original draught.'—*Cotgrave.*

Our souls, though they might have perceived images themselves, by simple sense; yet it seems inconceivable, how they should apprehend their *archetypes.* *Glanville's Scepsis.*

As a man, a tree, are the outward objects of our perception, and the outward *archetypes* or patterns of our ideas; so our sensations of hunger, cold, are also inward *archetypes* or patterns of our ideas. But the notions or pictures of these things, as they are in the mind, are the ideas. *Watts's Logic.*

Through contemplation's optics I have seen
Him, who is fairer than the sons of men;
The source of good, the light *archetypal.* *Norris.*

ARCHETYPE; from αρχη, and τυπος, a type; in mechanics, the first model of a work, which is copied after to make another like it. Among minters, it is used for the standard weight by which the others are adjusted. The archetypal world, among Platonists, means the world as it existed in the idea of God before the visible creation.

ARCH-EUNUCH, the chief of the eunuchs; one of the principal officers in Constantinople, under the Greek emperors.

ARCHEUS; probably from αρχος; a word by which Paracelsus seems to have meant a power that presides over the animal economy, distinct from the rational soul: a sort of primum mobile, supposed by Van Helmont to superintend the animal economy, and preserve it. It is akin to Plato's anima mundi. Neither of these suppositions, nor that of Paracelsus, appear to have the smallest foundation. Van Helmont carried his idea to a most extravagant height, placing an archeus in the stomach to superintend digestion; and ascribing sympathies, antipathies, diseases, &c. to the archeus being pleased or displeased.

ARCHEUS, in chemistry, the highest spirit that can be extracted from mixed bodies.

ARCHEUS, in medicine; αρχαιος, ancient; the ancient practice concerning which Hippocrates wrote a treatise. Hippocrates also used the words αρχαιη φυσις, for the former healthy state, before the attack of the disease.

ARCH-FLAMINES, in antiquity, the chief priests among the ancient Romans.

ARCH-HERETIC, a term of reproach among bigots, applied to the advancer or supporter of an opposite opinion in religion, whether right or wrong.

ARCHIACOLYTHUS; from αρχος, chief, and ακολυθος, minister; the chief of the acolythi, an ancient dignity in cathedral churches; the ministers whereof were divided into four orders, priests, deacons, subdeacons, and acolythi; each of which had their chiefs.

ARCHIAS, a poet of Antioch, who wrote a Greek poem on the Cimbrian war.

ARCHIATER, ARCHIATRUS; from αρχος, and ιατρος, a physician; the first physician to a prince who retains several, according to Mercurialis, Casaubon, and Vossius; or the prince of physicians; or, which is more probable, it signifies both.

AR'CHICAL. From Gr. αρχη. Principal, chief.

Mind and understanding, counsel and wisdom, did not lay the foundation of the universe; they are no *archical* things; that is, they have not the nature of a principle in them. *Cudworth*, p. 73.

ARCHIDAMIA; Αρχιδαμια; a Spartan woman, daughter of Cleadas, who, understanding that it was decreed in the senate to send away the women into Crete, when the city was besieged by Pyrrhus, rushed among the senators sword in hand, declaring that the women were as ready to fight as the men, on which the decree was revoked. *Plut. in Pyrrh.*

ARCHIEROSYNES; from αρχος, and ιερος, sacred; in the Grecian antiquity, a high priest vested with authority over the rest of the priests, and appointed to execute the more sacred mysterious rites of religion.

ARCHIGALLUS, in antiquity, the high priest of Cybele, or the chief of the eunuch priests of that goddess, called Galli.

ARCHIGERONTES; from αρχος, and γερων, old; in antiquity, the masters of the companies of artificers at Alexandria. Some have mistaken the archigerontes for the arch-priests appointed to take the confessions of those who were condemned to the mines.

ARCHIGUBERNETA, ARCHIGUBERNITES, ARCHIGUBERNUS, in antiquity, the commander of the imperial ship, or that on which the emperor was aboard. Some have confounded the office of archigubernus with that of præfectus classis, or admiral; but the former was under the command of the latter. Potter takes the proper office of the archiguberneta to have been, to manage the marine affairs, to provide commodious harbours, and order all things relating to the sailing of the fleet, except what related to war.

ARCHIL, or ARCHILLA, called also Rocella, and Orsielle, is a whitish moss which grows upon rocks, in the Canary and Cape de Verd Islands, and yields a rich purple tincture, fugitive indeed,

but extremely beautiful. This weed is imported to us as it is gathered. Those who prepare it for the use of the dyer grind it betwixt stones so as thoroughly to bruise it, but not to reduce it into powder, and then moisten it occasionally with a strong spirit of urine, or urine itself mixed with quicklime: in a few days it acquires a purplish red, and at length a blue color. In the first state it is called archil; in the latter lacmus, or litmus. The dyers rarely employ this drug by itself, on account of its dearness and the perishableness of its beauty. The chief use they make of it is for giving a bloom to other colors, as pinks, &c. This is effected by passing the dyed cloth or silk through hot water lightly impregnated with the archil. The bloom thus communicated soon decays upon exposure to the air. Mr. Hellot informs us, that by the addition of a little solution of tin this drug gives a durable dye; that its color is at the same time changed towards a scarlet; and that it is the more permanent in proportion as it recedes the more from its natural color. Prepared archil very readily gives out its color to water, to volatile spirits, and to spirit of wine. It is the substance principally made use of for coloring the spirits of thermometers. As exposure to the air destroys its color upon cloth, the exclusion of the air produces a like effect in these hermetically sealed tubes, the spirits of large thermometers becoming in the compass of a few years colorless. M. l'Abbe Nollet observes, in the French Memoirs for 1742, that the colorless spirit, upon breaking the tube, soon resumes its color, and this for a number of times successively; that a watery tincture of archil included in the tubes of thermometers, lost its color in three days; and that in an open deep vessel it became colorless at the bottom, while the upper part retained its color. See COLOR-MAKING. A solution of archil in water applied on cold marble, stains it of a beautiful violet or purplish blue color, far more durable than the color which it communicates to other bodies. M. du Fay says, he has seen pieces of marble stained with it, which in two years had suffered no sensible change. It sinks deep into the marble, sometimes above an inch, and at the same time spreads upon the surface, unless the edges be bounded by wax or other like substances. It seems to make the marble somewhat more brittle. Linnæus informs us, in the Swedish Transactions for 1742, that the true archil moss is to be found on the western coasts of England.

There is a considerable consumption of an article of this kind manufactured in Glasgow by Mr. Mackintosh, and sold by the name of cudbear. We have seen beautiful specimens of silk thus dyed, the colors of which were said to be very permanent, of various shades, from pink and crimson to a bright mazarine blue.

Litmus is likewise used in chemistry as a test, either staining paper with it, or by infusing it in water, when it is very commonly, but with impropriety, called tincture of turnsole. The persons by whom it was formerly prepared gave it the name of turnsole, pretending that it was extracted from the turnsole, heliotropium tricoccum, in order to keep its true source a secret. The tincture should not be too strong, otherwise it will have a violet tinge, which, however, may be removed by dilution. The light of the sun turns it red even in close vessels. It may be made with spirit instead of water. This tincture, or paper stained with it, is presently turned red by acids; and if it be first reddened by a small quantity of vinegar, or some weak acid, its blue color will be restored by an alkali.

ARCHILOCHIAN, a term in poetry, applied to a sort of verses of which Archilochus was the inventor, consisting of seven feet; the first four whereof are ordinary dactyls, though sometimes spondees; the last three trochees; e. g.

Solvitur acris hyems, grata vice veris et Favoni.

ARCHILOCHUS, a famous Greek poet and musician, was, according to Herodotus, contemporary with Candaules and Gyges, kings of Lydia, who flourished about the fourteenth Olympiad, and A. A. C. 724. But he is placed much later by modern chronologists: viz. by Blair in A. A. C. 686, and by Priestley in 660. He was born at Paros, one of the Cyclades. His father Telesicles was in so respectable a station, that he was chosen by his countrymen to consult the oracles at Delphos concerning the sending a colony to Thasos; but his mother, Enipo, was a slave whom Telesicles, notwithstanding his high rank, made his wife. Though Archilochus evinced an early attachment to poetry and music, these arts did not prevent his entering the army; but, at the first engagement at which he was present, the young poet, like Horace and our own Suckling, lost his buckler though he saved his life by flight. 'It is much easier (said he) to get a new buckler than a new existence.' This pleasantry, however, did not save his reputation; nor could his poetry or prayers prevail upon Lycambes, the father of his mistress, to let him marry his daughter though she had been long promised him. After these mortifications, his life seems to have been one continued tissue of disgrace and resentment; so that the rage of Archilocus became proverbial; and the provoking this satirist was compared to the treading upon a serpent: a comparison not too severe, if it be true that Lycambes and his three daughters were so mortified by his Satire, as to be driven to the commision of suicide. In this piece many adventures are mentioned, full of defamation, and out of the knowledge of the public. There were likewise many loose passages in it; and it is said to have been on account of these that the Lacedæmonians laid a prohibition on his verses. However, Plutarch says there is no bard of antiquity by whom the two arts of poetry and music have been so much advanced as by Archilochus. To him is attributed particularly the sudden transition from one rhythm to another of a different kind, and the manner of accompanying those irregular measures upon the lyre. Heroic poetry, in hexameter verse, seems to have been solely in use among the more ancient poets and musicians; and the transition from one rhythm to another, which lyric poetry required, was unknown to them; so that if Archilochus was the first author of this transition he might with propriety be styled the inventor of lyric poetry, which, after his time, became a species of versification wholly distinct from heroic. To him is [illegible]

cribed the invention of epodes. See Epode. He is also generally reckoned among the first victors of the Pythic games: and we learn from Pindar that his muse was not always a termagant; for though no mortal escaped her rage, yet she was at times sufficiently tranquil and pious to dictate hymns in praise of the gods and heroes. One in particular, written in honor of Hercules, acquired him the acclamations of all Greece; for he sung it in full assembly at the Olympic games, and received from the judges the crown of victory. This hymn, or ode, was afterwards sung in honor of every victor at Olympia who had no poet to celebrate his particular exploits. Archilochus was at last slain by one Callondax Corax, of the island of Naxos; who, though he did it in battle, according to the laws of war, was driven out of the temple of Delphi, by command of the oracle, for having deprived of life a man consecrated to the muses. The names of Archilochus and Homer were equally revered and celebrated in Greece, as the two most excellent poets which the nation had ever produced.

ARCHIMAGUS, the high-priest of the Persian magi, or worshippers of fire. He resided in the highest fire-temple, which was held in the same veneration with them, as the temple of Mecca among the Mahommedans. Zoroaster first settled it at Balck; but after the Mahommedans had overrun Persia in the seventh century, Archimagus was forced to remove from thence into Kerman, a province of Persia, lying on the Southern Ocean, where it has continued to this day. Darius Hystaspes took upon himself the dignity of Archimagus; for Porphyry tells us, he ordered, before his death, that among the other titles, it should be engraven on his monument, that he had been master of the magi; which plainly implies, that he had borne this office among them; for none but the Archimagus was master of the whole sect. From hence it seems to have proceeded, that the kings of Persia were ever after looked on to be of the sacerdotal tribe, and were always initiated into the sacred order of the magi before they took on them the crown, and were inaugurated into the kingdom.

ARCHIMANDRITE, in ecclesiastical history, was a name given by the ancient Christians to what we now call an abbot. Among the Greeks, by whom it is chiefly used, it is always restricted to the chief of an abbey.

ARCHIMEDES, a celebrated geometrician, born at Syracuse, in the island of Sicily, and related to Hiero, king of Syracuse. He was remarkable for his extraordinary application to mathematical studies; in which he used to be so much engaged, that his servants were often obliged to take him from them by force. And he affirmed to Hiero, if he had another earth whereon to plant his machines he could move this which we inhabit. He is said to have formed a glass sphere, of most surprising workmanship, wherein the motions of the heavenly bodies were represented; and immediately discovered the exact quantity of the silver which a goldsmith had mixed with the gold in a crown he had made for the king. He took the hint of this discovery from his perceiving the water rise up the sides of the bath as he went into it, and was filled with such joy, that he ran naked out of the bath, crying Ευρηκα! Ευρηκα! 'I have found it! I have found it!' By the invention of machines he for a long time defended Syracuse on its being besieged by Marcellus. (See Syracuse.) On the city's being taken, that general commanded his soldiers to have a particular regard to the safety of this truly great man; but his care was ineffectual. 'What gave Marcellus the greatest concern (says Plutarch), was the unhappy Archimedes, who was at that time in his museum, and his mind as well as his eyes so fixed and intent upon some geometrical figures, that he neither heard the noise and hurry of the Romans, nor perceived that the city was taken. In this depth of study and contemplation a soldier came suddenly upon him and commanded him to follow him to Marcellus, which he refusing to do till he had finished his problem, the soldier, in a rage, drew his sword and ran him through the body.' This happened A. A. C. 208. Cicero, when he was quæstor in Italy, discovered his tomb, on which was carved a cylinder and sphere. Some of the works of this great man are lost: there are preserved: 1. Two books of the Sphere and Cylinder. 2. The Dimensions of a Circle. 3. Of Centres of Gravity, or Æquiponderants. 4. Of Spheroids and Conoids. 5. Of Spiral Lines. 6. The Quadrature of a Parabola. 7. Of the Number of the Sand. 8. Of Bodies that float on Fluids. The best edition of these is that published at London, 1675, 4to. Among the works of Archimedes which are lost, we may reckon the descriptions of the following inventions, which we may gather from himself and other ancient authors: 1. Περι της στεφανης, or his account of the method which he used to discover the mixture of the gold and silver in the crown. 2. His description of the Κοχλια, or Κοχλιον, an engine to draw water out of places where it is stagnated. Athenæus, speaking of the prodigious ship built by the order of Hiero, tells us, that Archimedes invented the cochlion, by means of which the hold, notwithstanding its depth, could be drained by one man. (Δειπνοσοφιστων, lib. v.) Diodorus Siculus informs us, that he contrived this machine to drain Egypt; and that by a wonderful mechanism it would empty the water from any depth. 3. The Ελιξ, by means of which (according to Athenæus, Δειπνος, lib. v.) he launched Hiero's great ship. 4. The Τριστωστον, of thepower of which Tzetzes gives a hyperbolical relation, Chil. ii. hist. 35. 5. The machines he used in the defence of Syracuse against Marcellus. Of these we have an account in Polybius, Livy, and Plutarch. 6. His burning-glasses, with which he is said to have set fire to the Roman galleys. Galen, Περι κρασεων, lib. iii. 7. His pneumatic and hydraulic engines, concerning which he wrote books, according to Tzetzes.

ARCHIMIME, or Archimimus; from αρχη and μιμος, mimic; an arch buffoon, or capital mimic. The archimimes, among the Romans, were persons who imitated the manners, gestures, and speech both of people living and those who were dead. At first they were only

employed on the theatre; but were afterwards admitted to their feast, and at last to their funerals; where they walked after the corpse, counterfeiting the gestures and behaviour of the person who was carried to the funeral pile.

ARCHIPELAGO, in geography, a general term, implying a sea interrupted by a great number of islands, and formed by corruption of Ægeopelagus, Αιγαιον Πελαγος, the Ægean Sea; a name originally given it by the Greeks; but for what reason it is not agreed on. See ÆGEAN SEA. To this sea, however, the name is now in some measure appropriated. It is called the White Sea, in contradistinction to the Euxine, or Black Sea; and is that part of the Mediterranean, which lies between Europe and Asia; having the Morea, Livadia and Macedonia on the west, Romania on the north, Natolia on the east, and the isle of Candia on the south. It contains a great number of islands; such as Andros, Antiparos, Argentiera, Cerigo, Delos, Lemnos, Milo, Metelin, Naxia, Negropont, Paros, Patmos, Rhodes, Samos, Santorin, Scio, Scyros, Tenedos, Tina, &c. All these lie between the thirty-fifth and fortieth degrees of north latitude. Some of them are called Cyclades, because they form as it were a crown and circle round Delos; others are called Sporades, as being dispersed without any order between Asia and the isle of Candia. These islands are under the dominion of Turkey, and the rapacity and stupidity of their governors is proverbial. The public burdens are great: most of them are included in the government of the capudan-pacha, or grand-admiral of the Turkish fleet; but Mitylene, Scio, and Makronisi, are differently circumstanced; the revenue of the first going to the sultana mother, that of the second to the sister of the grand seignior, and that of the third, with the tribute of the city of Athens, to the kislaraga, or commander of the black eunuchs. The professed religion is that of the Greek church; but not a few are members of what is called the united Greek and Catholic church.

ARCHIPELAGO, COLUMBIAN, a name that has been sometimes given to the West Indies.

ARCHIPELAGO NORTHERN, extends between the east coast of Kamschatka and the west coast of America, and comprehends four clusters of islands: viz. 1. Sasignan, containing five islands. 2. Khoa, including eight islands; both these groups together are called the Aleutian islands. 3. The Andreanoffski Ostrova comprises sixteen islands. 4. The Lyssie, or Fox islands, include also sixteen islands. Modern geographers mention other Archipelagos, as follows:—

ARCHIPELAGO OF LAZARUS, near the coast of Malabar and Malacca.

ARCHIPELAGO OF THE GREAT CYCLADES, a cluster of islands in the South Pacific Ocean, so named by Bougainville, the French navigator, and afterwards called New Hebrides by captain Cook. See HEBRIDES, NEW.

ARCHIPELAGO OF THE PHILIPPINES, called by some the Great Archipelago, containing the Philippines, the Moluccas, Celebes, &c.

ARCHIPELAGO OF THE RECHERCHE, several groups of islands, rocks, and shoals on the south coast of New Holland, extending from between 34° to 34° 30′ south latitude, and 121° 30′ to 123° 20′ east longitude. The largest islands were named by the French, Mondrain and Middle Island.

ARCHIPHERACITÆ; formed of αρχος, chief, and the Hebrew or Chaldee פרק, division or chapter; ministers in the Jewish synagogues, appointed to read and interpret the Perakin, or titles and heads of the law and the prophets. Grotius supposed them the same with the Archisynagogues; but they were rather the chiefs of these.

ARCHIPPUS, in entomology, a species of papilio that inhabits South America.

ARCHIPRESBYTER, or ARCH-PRIEST, a priest established in some dioceses with a superiority over the rest. He was anciently chosen out of the college of presbyters at the pleasure of the bishop. These archpresbyters were much of the same nature with deans in the cathedral churches, as the college of presbyters answers to the chapter. See PRESBYTER.

ARCHISTRATEGUS, the generalissimo, or captain-general of an army. See STRATEGUS.

ARCHISYNAGOGUS, the chief of the synagogue; the title of an officer among the Jews, who presided in their synagogues and assemblies. The number of these officers was not fixed nor the same in all places; there being seventy in some, and in others only one. They are sometimes called princes or angels of the synagogue, and had a power of whipping or excommunicating such as deserved these punishments.

ARCHITECTOGRAPHIA, the description of ancient buildings, temples, theatres, arches, pyramids, baths, gates, aqueducts, tombs, &c.

ARCHITECTONICE; αρχιτεκτονικη, Gr. See ARCHITECTURE.

ARCHITECTURE.

AR'CHITECT,
AR'CHITECTIVE,
ARCHITECTO'NICAL,
ARCHITECTO'NICK,
AR'CHITECTOR,
AR'CHITECTRESS,
AR'CHITECTURE,
ARCHITEC'TURAL.

From αρχος, and τεκτων, from τευχω, to build. A chief builder. One who plans, contrives, directs and superintends a building according to the rules of his art.

An irreligious Moor,
Chief *architect* and plotter of these woes.
Shakspeare.

The hasty multitude
Admiring enter'd; and the work some praise,
And some the *architect*; his hand was known
In heav'n, by many a tow'red structure high;
Where scepter'd angels held their residence,
And sat as princes. *Milton.*

Our fathers next, in *architecture* skill'd,
Cities for use, and forts for safety build;
Then palaces and lofty domes arose;
These for devotion, and for pleasure those.
Blackmore

How could the bodies of many of them, particularly the last mentioned, be furnished with *architective* materials? *Derham. Physico-Theology.*

Architecture is divided into *civil architecture*, called by way of eminence *architecture*; *military architecture*, or fortification; and *naval architecture*, which, besides building of ships and vessels, includes also ports, moles, docks, &c. *Chambers.*

Rome will bear witness that the English artists are as superior in talents as they are in numbers to those of all nations besides; I reserve the mention of her *architects* as a separate class. *Cumberland.*

ARCHITECTURE, *αρχιτεκτονία*, Gr.; architectura, Lat.; the art or science of inventing and drawing designs for buildings: in other words, as the Greek etymology of the term expresses, the art of designing well according to just and harmonious rules and proportions.

2. Architecture, strictly speaking, may be divided into three separate classes: civil, military, and naval. The former, to the consideration of which this article will be limited, has appropriated to itself, emphatically, the general name of the art; the second class, which respects FORTIFICATION, will be found treated of under that head; and for the third, including, besides the building of ships and other vessels, the formation of ports, moles, docks, &c., the reader is referred to the article on SHIP-BUILDING.

INTRODUCTION.

3. Amongst all the arts which the inventive ingenuity of mankind has at different periods originated, to administer to the wants and weaknesses of human nature, this must surely be ranked in the very highest class: not only does it contribute in the first degree to the blessings and comforts of civilized life; not only does it give a tangible shape, a 'local habitation and a name,' to the soft endearments of home—but it affords likewise a pregnant subject for the eye of taste to dwell on; and is largely instrumental in exciting that refined and imaginative pleasure which springs from the contemplation of abstract beauty and proportion.

4. Civil architecture, or, as we shall at once term it, architecture, is itself divisible into a number of different branches, according to the styles adopted by the various nations practising it, and according to the several eras in which it has been practised. An intelligent French writer on architecture, of the present day, gives us the following enumeration:—Egyptian, Indian, Persian, Phenician, Hebraic, Chinese, Greek, Roman, and Gothic, to which list may be added, the Etruscan, the Moorish or Saracenic, the Saxon, and the English. With regard to epochs, the characteristics arising from these may be ranged under four great heads, namely, ancient architecture, that of the lower empire, that of the middle ages, and modern architecture.

5. Before we proceed to the investigation of these varieties, in the course of which we shall trace back the progress of our interesting art to its earliest dawn, and accompany it through the 'changes and chances' by which it rose to meridian splendor amongst the Greeks and Romans; declined with the corresponding decline of intellect in its second great stage; and sunk into barbaric darkness in the third; not, however, to rise no more;—it may not be amiss to impress still more strongly on the imagination of the reader or student the manifold and great advantages derivable from its cultivation.

6. Architecture may be regarded both as an art and as a science; and the practitioner will find it necessary to bear both definitions constantly in view; since otherwise he would be in danger, on the one hand, of degenerating into a mere artizan; or, on the other, of becoming a theorist, whose designs are bounded by the picturesque, and extend not to the practical or useful. The great architects of Greece and Rome understood construction as well as effect; as is abundantly proved by those illustrious monuments which still survive to indicate their superiority.

7. By the means of architecture we are furnished with a test from which may be inferred the comparative cultivation and progress of intelleet between man arrived at a high state of civilization and his ruder forefathers; and the opinion of Plato should not be forgotten, that even the study of politics and legislation began with the building of cities. The lofty and stupendous pyramids, obelisks, and temples of Egypt, bear witness to the truth of history and tradition which represent the grandeur and numerical strength of the ancient dwellers on the banks of the Nile. The relics of ancient Athens attest the veracity of those authors who attributed to its population a refined and elegant taste, and an unsurpassable perception of beauty and harmony. The work of the sculptor, nay, in some instances, even of the painter, defies oblivion, introduced on the walls of the architect; and the magic powers of Apelles receive our faith, since they are vouched for by the same historians who had taste to perceive, and eloquence to describe, the architectural beauties which remain to excite similar sensations in ourselves.

PART I.

HISTORY OF THE ART.

8. Great caution must be observed in speculating on the state of this art among the nations of antediluvian celebrity. It may, we think, safely be conceded, that they did possess a system of architecture; but it was probably of a very rude and unsophisticated description. The Mosaic account affords but little light to guide us on this subject; and whether the deluge was an unique occurrence, or, as some philosophers are inclined to imagine, was several times repeated, we are still left in the dark as to the height which the arts and manners of civilized life had obtained among the primeval races who previously lorded it over our globe.

9. It is a curious fact, that although most of the known countries of the world concur in belief and affirmation of a universal deluge, yet each differs, according to its prevailing opinion and traditions, both with regard to date and circumstances; and in the only record which we ourselves possess of a period nearly equalling in

extent the whole of the Christian era hitherto, the history of that period is altogether comprised in six short chapters.

10. This is not the place to enter at greater length on this disquisition; and we have only alluded to it here, for the purpose of rendering it manifest that we must be content to remain in ignorance as to the peculiarities which distinguished, or the general features of resemblance which amalgamated, the antediluvian populations from or with their successors on the face of the earth.

11. If indeed we were to give loose to imagination, we might be induced, from certain statements of an astounding and picturesque nature, introduced into that brief chronicle, to award to the antediluvian races an extraordinary portion of greatness and skill. 'There were giants in those days:' and the age of man, now limited to the fleeting period of threescore years and ten, was then drawn forth to the majestic duration of eight or nine centuries. In this space, what scope for the intellectual faculties to expand and break forth, as well as the physical ones! Fancy pictures to us the existence of temples, vast in comparison with ours, as their superior longevity; of domes high, almost, as the visible heavens; of cities sufficiently splendid and imposing to receive the 'sons of God,' when they descended to breathe the aspirations of love towards the 'daughters of men.'

12. But we will waive all further consideration of this undefined era, and proceed to examine, generally, the incipient attempts of architecture, and the rough originals from which the refinements both of ancient and modern art were deduced. Moses speaks, in describing the tribes which descended from the children of Noah, of numerous cities built by them in the ages immediately succeeding the flood. These primitive towns were, it is probable, like all others, the product of rude populations, made up of small straggling huts, thrown irregularly about, built of turf or rough stones, thatched with reeds or straw, and lighted only by the aperture used as a door, the entrance by which required the inhabitant, from its lowness, to gain admission in an inclined posture.

13. It has frequently been said, that the first materials employed in building were twigs of trees, wherewith men constructed huts, such as the wigwams in use at this day among the American Indians. This, however, may be disputed; as the natural shelter afforded by hollows in the sides of mountains or rocks would, it may be imagined, much more readily suggest the idea of using stones or earth as the materials for building houses. Even in America, where the human race has perhaps appeared in the rudest form, they were no sooner collected into great bodies, under the emperors of Mexico and Peru, than stone buildings began to be erected. We are not, indeed, to look for the origin of architecture in any single nation; but in every one, when the inhabitants begin to leave off their savage way of life, and to become civilized.

14. 'Anciently,' says Vitruvius, 'men lived in woods, and inhabited caves; but in time, taking example perhaps from birds, who with great industry build their nests, they made themselves huts. At first they made these huts, very probably, of a conic figure; because that is a figure of the simplest structure; and, like the birds, whom they imitated, composed them of branches of trees, spreading them wide at the bottom, and joining them in a point at the top; covering the whole with reeds, leaves, and clay, to screen them from tempests and rain.—See first example in plate III.

15. 'But finding the conic figure inconvenient on account of its inclined sides, they changed both the form and construction of their huts, giving them a cubical figure, and building them in the following manner: having marked out the space to be occupied by the hut, they fixed in the ground several upright trunks of trees to form the sides, filling the intervals between them with branches closely interwoven and covered with clay. The sides being thus completed, four large beams were placed on the upright trunks; which, being well joined at the angles, kept the sides firm, and likewise served to support the covering or roof of the building, composed of many joists, on which were laid several beds of reed, leaves, and clay.—See second example in plate III.

16. 'Insensibly mankind improved in the art of building, and invented methods to make their huts lasting and handsome as well as convenient. They took off the bark and other unevennesses from the trunks of trees that formed the sides; raised them, probably, above the dirt and humidity, on stones; and covered each of them with a flat stone or slate to keep off the rain. The spaces between the ends of the joists were closed with clay, wax, or some other substance; and the ends of the joists covered with thin boards cut in the manner of triglyphs. The position of the roof was likewise altered; for being, on account of its flatness, unfit to throw off the rains that fell in great abundance during the winter season, they raised it in the middle; giving it the form of a gable roof, by placing rafters on the joists, to support the earth and other materials that composed the covering.—See third example in plate III.

17. 'From this simple construction the orders of architecture took their rise. For when buildings of wood were set aside, and men began to erect solid and stately edifices of stone, they imitated the parts which necessity had introduced into the primitive huts; insomuch that the upright trees, with the stones at each end of them, were the origin of columns, bases, and capitals; and the beams, joists, rafters, and strata of materials that formed the covering, gave birth to architraves, friezes, triglyphs, and cornices, with the corona, the mutules, the modillions, and the dentils.'

18. 'The first buildings were in all likelihood rough and uncouth; as the men of those times had neither experience nor tools: but when, by long experience and reasoning upon it, the artists had established certain rules, had invented many instruments, and by great practice had acquired a facility in executing their ideas, they made quick advances towards perfection, and at length dis-

covered certain manners of building, which succeeding ages have regarded with the highest veneration.'

19. Perhaps the earliest cultivators of architecture, as a fine art, were the Assyrians, whose empire was founded by Nimrod, the builder of the far-famed Nineveh. About the same era Troy is said to have been founded by Scamander; while Mizraim, the son of Ham, led a colony into Egypt, and laid the foundation of a kingdom. Babylon, the chef-d'œuvre of the Assyrians, is related by Pliny to have been a magnificent city, sixty miles in circumference; that its walls were 200 feet high and 50 thick, and that the temple of Jupiter Belus was standing there in his time. (Plin. lib. vi. c. 26.) Herodotus states it to have been 480 furlongs in circumference, and speaks of a hundred gates of brass; if these existed, it is unquestionably proved that the fusion of metals was known and practised in those days, and, as may fairly be supposed in consequence, many other arts too often held peculiar to later and more refined ages.

20. From Assyria the arts passed into Egypt, one of the most ancient nations in the world, and to which, it is probable, we may fairly attribute the rise of the habits and pursuits of cultivated life into a tangible and definite form. The genius of Egypt was grand and stupendous; the moral character of its inhabitants sententious and grave. The architectural monuments which sprang up amongst them partook largely of these characteristics. The far-descried obelisk, whose proud and lofty top seems to emulate the mad ambition of the tower of Babel; the immense pyramid, whose far-spreading base and uncouth shape loads the earth like a tremendous incubus; the colossal sphinx, whose huge staring countenance is awful even by reason of its magnitude and ugliness:—these all bear witness to the heavy, yet sublime taste, by which they were engendered.

21. Egyptian architecture may indeed be said, generally speaking, to be characterised by massive solidity and stiffness of contour; and yet it is the parent of lightness and the most bewitching grace. It is itself solemn, sepulchral, overpowering: from it has sprung the airy elegance of the Grecian, and, by another remove, the lordly splendor of the Roman style. In Egypt, the capitals of columns were formed from branches of palm, or from leaves of the papyrus or lotus, plants native to the country; in Greece the suggestion was adopted, but the Grecian plant substituted, as in the instance of the acanthus.

22. Several ingenious speculations have been put forth in order to account for this prevailing character of Egyptian art. For ourselves, we think, in the first place, that considerable stress may be laid on the effects of climate. The heavy burning atmosphere, which hangs so much over the land of Egypt, no doubt induced its primeval inhabitants to excavate for themselves cool dwellings in the recesses of the rocks; and hence may have originated their style of building, massy and sepulchral. In the second place, it must be recollected that the Egyptians flourished antecedently to the Greeks, and that the first achievements of mankind, in any art, tend to the rude and solid, and have an eye to the wants and conveniences rather than to the elegancies and luxuries of life. Besides, the Egyptians were ignorant of the construction of the arch, and were consequently compelled to provide for its absence by an accumulation of clumsy pillars and heavy architraves, extremely offensive to the eye of a just taste.

23. It must be allowed, however, that the ancient Egyptian buildings, with all their defects, had an air of vast magnificence. They attest, indeed, rather the great exertion of the physical than of the intellectual power; and it may be remarked, that mere extent is one considerable principle of grandeur; but nevertheless, when we read of such edifices as the portico of Hermopolis, 120 feet long and 60 feet high, each one of its columns 35 feet in circumference, and the whole enriched with appropriate ornaments, all harmonising with the general effect of the building;—when, again, we contemplate the recorded glories of the temple of Dendera or Tentyra, which splendid structure—splendid, although simple in design—was covered with bassi-relievi, hieroglyphics, and sculptures of mystical and historical subjects;—when works such as these, together with their baffling labyrinths and endless colonnades, are referred to, it is impossible for the mind to remain unimpressed by a conviction that the genius of the arts had unveiled no small portion of her loveliness to the eyes of the dusky dwellers on the banks of the Nile.

24. The different kinds of edifices peculiar to the Egyptains are: the subterranean grotto; the pyramid; the obelisk; the labyrinth, that immense collection of halls, of which Herodotus, Pliny, and Strabo, have left us descriptions; the monolithal chamber (constructed of a single stone); and their stupendous temples covered with hieroglyphics, paintings, and sculptures, and preceded by ranges of carved animals, of sphinxes, or of obelisks.

25. The walls of Egyptian buildings were extremely thick, the ceiling or roof often consisting of a single block of stone. These roofs of course required a great number of pillars for their support, which were sometimes square, sometimes octagon, or even with sixteen faces, and often round. The proportions of the columns, as well as of their ornaments, varied greatly. They had commonly either no base, or one constructed on a very simple plan. The form of the capital was likewise quite arbitrary. In some instances it presented nothing but a square slab, heaped with hieroglyphics; in others (see the specimens given in plate V.) it was adorned with foliage, or represented a vase placed upon the column, or a bell reversed. There is neither frieze nor architrave, strictly speaking; but an equivalent for the latter is found in the stones placed upon the columns. The intercolumniation rarely exceeds three feet or three feet and a half. The doors frequently offer a peculiar construction, called by Pococke pyramidal; and which consists in the hinges being farther from each other at top than at bottom.

26. We have already stated that the Egyptian architects were unacquainted with the formation of the arch. They have, however, found para-

sans desirous of vindicating them from this species of ignorance. Dr. Pococke is among these, but he produces no satisfactory reason to account for his conviction. The late intrepid traveller Belzoni ranges himself on the same side, and discovered some rude specimens at Thebes and at Gournon. But the strength of the argument is against them.

27. However conjectural the origin of the Egyptian style may be, thus far at least is certain, that it is the fountain whence all succeeding people have drawn their most copious draughts, and is deserving of minute investigation. This style bears all the marks of freshness of invention drawn from native materials and national symbols. It is in the country of its origin that those colossal wonders, the pyramids, are situated; and, without dwelling on a long description of structures so monstrous, we think we cannot do better, before we take leave of this branch of our subject, than present the reader with a succinct account of the principal of those time-defying piles, which, after all, form the most prominent peculiarity of Egyptian architecture.

28. The largest of the three, which is some leagues distant from Cairo, forms a square, each side of whose base is 660 feet; its external circuit being, therefore, 2640 feet, and is nearly 500 feet in height. The dimensions of the great pyramid differ extremely in different authors, as may be seen in the following table.

Ancients.	Height.	Width 1 side.
Herodotus . .	800 feet	800
Strabo . . .	625	600
Diodorus . .	600 some inches	700
Pliny . . .	. . . .	708
Moderns.		
Le Brun . .	616	704
Prosp. Alpinus	625	750
Thevenot . .	520	612
Niebuhr . . .	440	710
Greaves . . .	444	648

Number of the layers or steps.

Greaves says .	207	Pococke	212
Maillet . . .	208	Belon .	250
Albert Leivenstein	260	Thevenot	208

As a general idea of this stupendous building, it is nearly the size at its base of the area of Lincoln's-Inn Fields, London, which has been said to have been made by its architect Inigo Jones of that size for the purpose of illustration, and its apex nearly one-third higher than the summit of the cross of St. Paul's cathedral. The summit of this largest pyramid at present finishes by a platform of about sixteen or seventeen feet square. This amazing mass of masonry is constructed with stones of an extraordinary size, many of them being thirty feet long by four in height, and three in thickness. Herodotus, Diodorus, and Pliny, say, that the stones employed in building the pyramid were brought from Ethiopia and Arabia. This fact M. Goguet with much probability doubts; for in the first place, he says, it is not likely that the kings of Egypt, having excellent materials at hand, should have unnecessarily expended immense sums to bring them from afar. Again, the stones of the pyramid have too near a resemblance to those which are found in the neighbourhood, for us to imagine that they were not taken thence. Yet it is probable that the stones referred to by these ancient authors may have been the marble with which the outside of the pyramids were covered, and may have been procured from the neighbourhood of the Red Sea, and from Upper Egypt.

29. Near to these pyramids is the colossal head called the Sphinx of Ghiza, the face of which resembles a woman, and the body that of a lion. This extraordinary figure is said to have been the sepulchre of the Egyptian king, Amasis; and is one entire stone, being sculptured out of a solid rock.

30. Under the sway of the Ptolemies, the taste respecting architecture in Egypt, altogether changed; and their buildings were constructed, in a great degree, on the principles of Grecian art. Indeed, there can be little doubt but that at length Grecian artists were employed to design them, although their style was modified somewhat by that which had preceded them, and the remains of which still lingered about the natives of the country.

31. The monuments of ancient Indian architecture which remain to gratify the ardent spirit of inquiry awake at the present period, consist chiefly of excavations from the rock. Of this description we meet with spacious halls and lofty columns, and solemn temples, constructed in such a manner as to excite in the beholder the strongest emotions of admiration and surprise.

32. These works are many of them, according to all tradition, of primeval antiquity; and, from the strong resemblance of style, appear to make out an early connection between India and Egypt. M. Meiners has indeed sought to show that these monuments are referable to no remoter a period than the commencement of the vulgar era, when the Indians might have received from the Greeks the elements of the arts and sciences. This, however, can scarcely be the case; since, in that event, they would not, in all probability, have been dug out of the rocks, but constructed in stone. Besides, the execution; the style, both of ornament and figures; in short, the *tout ensemble*; —are too far removed from the elegance and harmonious proportions of the Greeks to warrant us in giving evidence to the affinity sought to be established.

33. On the other hand, 'the pyramids, the colossal statues, the obelisks, the mummy pits, the subterranean temples with colossal figures, and the lion-headed sphinxes, discovered by Belzoni in Egypt, indicate the style and system of mythology to be akin to those of the indefatigable workmen who formed the vast excavations of Canarah, Elephanta, and Ellora;—the various immense pagodas, pillars, and colossal images of Buddha and other Indian idols.

34. One of the most remarkable specimens of these Indian excavations is to be found in the little island of Elephanta; perhaps so called from the circumstance of an elephant of black stone, of the size of life, being encountered near the landing-place. The elevated situation of this

temple, wrought in a hill of stone, and approached through a quiet and solemn valley, is very striking and impressive. It forms nearly a square of from 130 to 135 feet, and is about fourteen feet and a half in its interior height. The roof is supported by ranges of columns, disposed with sufficient regularity; and upon the walls gigantic figures are sculptured in relievo.

35. The shape of the columns, although certainly not competing in beauty and proportion with the fine productions of Greece, are still more agreeable and in a better taste than those of the Egyptians. The capitals may be likened to circular cushions depressed by the weight above them.

36. The island of Salsette (some ten miles to the north of Bombay) presents another instance of the stupendous achievements of Indian architecture. These excavations are situated in the neighbourhood of the village of Ambola. The temple, strictly speaking, describes a square of about twenty-eight feet, and is approached by a long walk, or alley, at the end of which stands the outer gate or doorway, twenty feet high, admitting the visitor to the grand vestibule, by which he is led to the inner door of the temple. On each side of this door are various figures sculptured in relief. The roof of the temple or pagoda is sustained by twenty columns, about fourteen feet in height, and resembling in form those at Elephanta, which however they scarcely equal, from the circumstance of the sculptures being wrought in a softer rock.

37. The excavations at Ellora, at Canarah, and other places, are of a similar character. The regular, systematic style in which they are constructed; the real beauty of many of the sculptured figures and columns; in a word, the artist-like appearance displayed by them in so many respects, leads us to conclude that they are the works of an ingenious as well as a powerful people, of whom the present natives of the country afford but a very tame and indifferent representation. If the excavated temples of India are compared with those built in Egypt after the regular fashion, the similitude of style will be exceedingly apparent. Among the elements of both, we observe close intercolumniations, rudely sculptured columns, and clumsy architraves. The column of Benares, however, amongst others, stands out conspicuously from the mass of Indian relics. This beautiful monument, respecting the workmanship of which conjecture has been extremely active, combines the elegance of Grecian taste with the general elements of the Indian style. Its shaft, base, and capital, are decidedly Hindu: the sculptured and other ornaments which decorate it, as decidedly Grecian. The Grecian honeysuckle is found on its pedestal, while the angular parts of the shaft display the holy water-leaves of the Brahman mythology; above, again, are Doric flutes, and the leaves of the Greek acanthus embellish the capital.

38. The ruins of ancient Persian architecture, although they do not indicate any great superiority as products of art, are yet remarkable when we consider the former greatness and splendor of the empire in which they were erected. The most distinguished are those of Perseopolis, once famous for containing a magnificent palace, the relics of which for a long while comprised forty pillars or columns, and were thence denominated by the inhabitants of the country chehul minar, or tschil minar, i. e. the palace of forty columns. Of these, however, the number has been gradually reduced, until it has fallen under one half of that quantity. Probably the name was originally given on the Mahommedans penetrating into that part of Persia. There have been some learned disputes as to whether the edifice to which these ruins appertain had been the residence of the kings of Persia, or a grand temple devoted to purposes of religious worship. The fact, however, of the Persians having anciently paid their adorations in the open air, added to the extent and multiform character of the mass, seems to accredit the former supposition. The style of architecture, the huge size of the blocks of stone, the great number of ornaments and of inscriptions (many rudely executed) all attest the high antiquity of these remains. They are constructed of a species of deep gray marble, very hard, which is susceptible of a beautiful polish, and thence becomes almost black. The adhesion of the stones is accomplished, not by means of cement, but of cramping irons, several traces of which remain. Great care and considerable skill appear to have been exercised in this respect.

39. There is undoubtedly some resemblance of style perceptible between the ruins of Persepolis and the ancient architectural relics of Egypt; but a practised eye will not fail to discover marks of distinction. The love of adornment seems to have prevailed in the Persian style in the greater degree, a fact which may be traced to the luxurious disposition of the people. Thus we find upon these ruins an immense number of figures sculptured in relief, with a greater or less degree of skill, most of which are supposed to refer to the history and exploits of their king, Dsjemschied, by whom tradition states the original pile to have been erected.

40. These noble ruins are now the shelter of birds and beasts of prey. Among the inscriptions still preserved, are several in Arabic, Persian, and Greek. Dr. Hyde has observed that the inscriptions are very rude and unartful; and that some, if not all, of them, are in praise of Alexander the Great.

41. Our next inquiry into the earlier stages of architecture leads us to take a glance at the productions of the Phœnicians. This primitive people, who possessed the arts of civilization at an extremely remote epoch, had several large cities, famous for their riches, manufactures, and extended commerce. The well-known names of Sidon, and Tyre its colony, of Joppa, of Damascus, and of Baalbec, vouch for the greatness and artistical eminence of this ingenious nation, which has been supposed to be the same as the 'land of Canaan,' so often spoken of in holy writ. Herodotus makes mention of a temple of Hercules at Tyre, on the beauty and richness of which he is very lavish of his encomiums. It is to be regretted that the extreme remoteness of the period of Phœnician prosperity deprives us of

the means whereby to ascertain the peculiar characteristics of its structure; but that they were peculiar is pretty obvious from the circumstance of an ancient authority (Strabo) in speaking of Tyre and Aradus, two isles in the Persian Gulf, adding that they had temples 'resembling those of the Phœnicians.'

42. There is reason for supposing that the Phœnician architects were much in the habit of employing timber instead of stone, Mount Lebanus, among other places, furnishing them with an abundant supply of the former material; and hence we are led to a consideration of Hebraic architecture, inasmuch as Phœnician artists were doubtless engaged in the building of Solomon's temple, a great portion of which was in all probability constructed of wood.

43. The Hebrews, or Israelites, acquired a considerable degree of civilisation during their residence in Egypt. After their deliverance from captivity, it was suggested to them by the temples they had seen in Egypt, to construct a place which they might dedicate to the worship of the true God. Owing to the necessity prescribed by their wandering kind of life, this assumed the shape of a spacious tent, and was denominated the tabernacle. The whole structure, according to the best authorities, covered a space of 100 biblical cubits, by 50 cubits wide; and the enclosure, five cubits high, was formed of wooden columns with brass bases and silver capitals, having curtains of tapestry suspended between them. These columns were sixty in number; twenty on each side, which lay north and south, and ten on each end, which faced the east and west. The Jews used this moveable temple for a length of time after the conquest of Palestine.

44. Under the reign of Solomon the grand temple was erected, preparations for which had been commenced by David, that monarch's father. The details afforded us by the Bible of this vast edifice are not very clear, and do not suffice to afford us any precise notions on the subject.

45. The summit of Mount Moriah formed a plain of 36,310 square feet. They began by levelling the top and sides of the mountain, against which they afterwards built a wall of freestone 400 cubits high. The circumference of the mountain at the foot was 3000 cubits. Upon the plain was built the temple, divided, like the tabernacle into two divisions, by a partition of cedar. Under the second, or the sanctuary, it appears they preserved the treasures of the temple.

46. In the principal front was the ulam, probably a grand portico, such as they had formerly seen in several Egyptian temples. The temples of the ancients were generally without windows: but that of Jerusalem appears to have had them, and of the same form as those observed in the ruins of the great temple of Thebes. The timbers of the ceiling were of cedar, and it appears that the roof was flat like the Egyptian temples.

47. Round the temple was a wall or enclosure, and the space between that and the temple was occupied by a porch divided into three stories. The principal edifice was preceded by two courts; the first and largest was for the assembly of the people: in the second, called the priests' court, was the temple. It was surrounded with apartments or houses, which were for the lodgings of the priests, for the preservation of the instruments used in sacrifice, and to confine the beasts, &c.

48. Before the ulam were two pillars of brass, whose capitals resembled, according to the expression of the Bible, 'lily work,' which indicates some resemblance to the Egyptian capitals, composed from the lotus flower. There is no mention made of bases, and it is probable that they had none. These were no doubt intended as a decoration to the whole, like the obelisks which were placed before the Egyptian temples.

49. The exterior walls of the temple were of stone, squared at right angles, and ornamented with the figures of cherubim, palm-leaves, flowers, &c. sculptured probably in the stone like the Egyptian hieroglyphics. The roof was covered with plates of gold, and the interior decorated in the richest manner; the Hebrews following the custom at that time of all civilised people in ornamenting their temples, they used a great quantity of gold and precious stones. Besides this temple, Solomon erected many other works, as the walls of Jerusalem, several public granaries, stables, &c.

50. It is remarkable that the dimensions of the two pillars, Jachin and Boaz, set up by Solomon, very nearly correspond with those of the Doric order, first invented by the Greeks, and which originally came from their colonies settled in Asia Minor. The height of Solomon's pillars, without the chapiter, was eighteen cubits; that of the chapiter itself was five cubits; the circumference was twelve cubits; from whence, according to the Scripture language, we may reckon the diameter to have been exactly four cubits. Had they been a single cubit higher, they would have been precisely of the same height with columns of the original Doric order.

51. We do not mean positively to affirm that this famous temple gave a model of architecture to the whole world; although it is scarcely conceivable but that imitations of it, as far as it could be known, must have taken place among many nations. But that no such imitations had reached Greece, and that Grecian architecture was in no great state of improvement for some ages after Solomon, is certain; since Homer, who was contemporary with Jehoshaphat, and whom some chronologists place even so low as Hezekiah, gives us no account of any thing like columns of stone in all his writings; but uses a word which makes it probable that the columns in his time were nothing better than bare wooden posts.

52. Of Chinese architecture, the original types and models appear to have been pavilions or tents, and evidences of this derivation are constantly visible in almost all their buildings. The materials chiefly employed by them are various kinds of wood, together with bricks and tiles burnt, or dried in the sun. The prevailing style of Chinese architecture, as has been observed by Mr. Elmes, 'must be familiar to every one who has drank from a China tea-cup, or who has seen many of the signs of grocers' shops, Sir William

Chambers's pagoda in Kew Gardens, or Mr. Nash's pavilion at Brighton.'

53. The fact is, that the peculiarities of the climate operate to prevent the free use of stone or marble, houses built of which would be uninhabitable for more than half the year even in the northern provinces. The governing rule of Chinese architecture, strange as it may seem, is not an abstract principle of taste, but the result of prescriptive police regulations. These state, with the most scrupulous accuracy, how the palace or lou should be built of a prince of the first, second, or third order of the imperial family, of a mandarin, or of a grandee of the empire; and not content with this, they proceed to regulate the public edifices of the capital, and also of provincial cities and towns, according to their different ranks or grades in the empire.

54. These laws of course produce a dull uniformity, and prevent the art from spreading into elegance or originality. One thing observable in the architectural usages of this people is their abundant use of pillars, which are employed literally as supports to the roofs, and are commonly of timber, with marble or stone bases, destitute of capitals, and occasionally with wreathed shafts. When used externally they support a kind of veranda or outer roof, which being too low for a house, the architect is induced to construct a second roof, within the peristyle, much higher. The palaces of China are remarkable for their great extent, as well as for the number of courts, galleries, halls, porticoes, &c.

55. But the most gigantic work of Chinese architecture is their celebrated wall, compared with which those of the Picts, the Romans, &c. sink into great inferiority. This stupendous fabric exceeded 2000 miles in length, and comprised 45,000 towers. We must not omit noticing, likewise, the science and mechanical skill displayed in the laying out of their canals, as well as in the construction of their bridges. But, taken altogether, there is little to recommend this light and weak style to the eye of the enlightened connoisseur.

56. We shall now proceed to investigate, after the brief manner to which our limits confine us, the origin and progress of Grecian art, the prototype of which is unquestionably to be sought in the more cumbrous, but still imaginative architecture of Egypt. Vitruvius, it is true, does not willingly give into this opinion; and adopts certain ingenious hypotheses calculated to increase the claims of the Greeks to undisputed originality. These hypotheses, however, carry great doubt on the very face of them; neither does the talented country whose champion he thus constitutes himself stand in need of the realization of such claims. Their merit is conspicuous enough as it is. The genius of man is, and always has been, progressive; and he who, taking up a preconceived idea, new moulds and shapes it, and renders it eminently more conducive to beauty and utility, may fairly challenge merit even more exalted than his who in the first place struck it out.

57. Cadmus, who flourished about 1500 years before the Christian æra, is reported to have introduced the arts and sciences into Greece, between 500 and 600 years after the building of the walls of Babylon. He built a city called, after the celebrated one in Egypt, Thebes, and it is not at all probable that he was satisfied with borrowing merely the name. The kingdoms of Athens, Argos, Sparta, and Thebes, were successively founded by Cecrops, Cadmus, Inachus, &c.

58. Art having begun to shed its beams steadily over these distinguished, though at first unimportant, colonies, their radiance was soon diffused throughout the whole country, and a taste gradually sprang up, the correctness and loveliness of which has been subscribed to by all subsequent ages; and which, not seeking to astonish by gigantic and useless productions, selected the choicest materials of preceding styles, and founded thereon that exact proportion, that perfect harmony of parts, which soon rendered the disciples of the Egyptians as completely their masters as ours.

59. It would occupy us too long to enter into a minute detail of the causes which operated to produce this superiority. One of the chief of them may be traced to the fact that, in Egypt, and we may add in Judea also, law and religion both were exerted to depress and restrain the progress of art. Contented not to retrograde, they had no desire to advance; whilst, on the other hand, the lively and enterprising populations of Greece were disposed to push every advantage presented to them to its utmost; and the arts were cultivated with the energy and passion proper to a young and free people, enjoying a climate of happy and exuberant beauty. The religion of Greece, likewise, drest in the most captivating colors of a splendid mythology, presented abundant subjects whereon to exercise the skill and taste of the painter, architect, or sculptor—the multiplicity of deities necessarily occasioning a want of places for their worship.

60. The Lacedemonians, that rigid and virtuous people, however simple and plain might be the exterior of their private dwellings, were not deficient in elegance and convenience, either of works of art or of furniture within. Desiring a handsome and healthy race of children, without deformity of limb or feature, they embellished the chambers of their females with the most exquisite models of loveliness and symmetry that their wives, having their imaginations filled with ideas of beauty, might bring forth a beautiful race. Thus did all the cities of Greece, particularly Athens, encourage the genius of the peaceful arts, which has given immortality to heroes, and has ennobled even voluptuousness. The people of Greece consecrated woods and dedicated temples; and the arts peopled them with images of the gods. This is a slight and rapid sketch of some of the causes which contributed to elevate to perfection the arts of Greece.

61. It is vain to endeavour to fix any precise date to the age of Homer. It may, however, be certainly regarded as nearly contemporaneous with an event most important in the history of Greece: we mean the return of the Heraclidæ to the Peloponnesus, and the circumstances attending the conquest of the peninsula, which occasioned a change equally extensive both in the manners and political condition of the inhabi-

tants. The Dorian invaders, and the sanguinary wars introduced by them, repressed that spirit of refinement which had already begun to distinguish the Grecian states; nor was it until a long time after the return of the descendants of Hercules, that we are enabled to dwell with any degree of certainty on the progress of the ornamental arts.

62. In the absence of authentic information, engendered by this unhappy state of things, Vitruvius endeavours to fill the void with a relation of the origin of the several orders constituting the main charm of Grecian excellence, which relation, although interesting, from its author and its subject, cannot be looked on as any other than a well-concerted fable. According to this statement of the learned Roman, Dorus, son of Helenus and of the nymph Optice, built a temple to Juno, in Argos, which, from mere chance, was decorated with columns assuming the proportions of the Doric order, at that time *utterly* unknown. Subsequently, says he, on the arrival in Asia of the Ionian colonists, they, desirous of erecting a temple to Apollo Panionius, and ignorant of the proper way to set about it, bethought them of measuring the human foot; and, having discovered that to be the sixth part of a man's height, adopted at once this proportion for the columns of the order, which thenceforth became known by the appellation of Doric. The same people, on building a temple to Diana, resolved to appropriate the style of it more particularly to themselves, and to apply to it their own name; with which intent they increased the height of the columns to eight diameters, thus rendering their appearance more airy and slender, and more indicative of the delicacy of the female than the robustness of the male. Bases were substituted for the abrupt termination of the former order; the volutes and ornaments of the capital resembled the head-dresses of the time, and the method of fluting the shaft was copied from the folds incidental to the draperies of the matrons of that era. *Vitruv.* l. iv. c. 1.

63. The Corinthian order differs from the Ionic, according to the same authority, only in its capital; the Ionic capital having no more than one-third of the diameter of the column for its height, while the Corinthian capital is allowed one entire diameter, which gives to the column a noble but delicate grandeur. The other members placed on the Corinthian pillar are common to the Doric and Ionic orders, for it is, in a manner, no more than a third order risen out of the former two, with nothing peculiar to itself but the capital.

64. In his explanation of the origin of the Doric and Ionic orders, Vitruvius has certainly told no tale that looks like an abandonment of the unvarnished course of historical truth for the alluring regions of romance. Although these different modes of building may, as has been imagined, have received their present appellation, not at the time of their invention, but long since that period, still there is nothing in the detail at variance with sound reason, or calculated to excite incredulity. With respect to the Corinthian order, however, the case varies. Wilkins, indeed, seems to think it, of all Vitruvius's statements, the most probable one; let the reader judge for himself:—

65. A marriageable young lady of Corinth fell ill and died. After the interment her nurse collected together sundry ornaments which pleased her while living, put them in a basket, and placed it on the top of her tomb, covering it with a tile, in order that it might endure the longer in the open air. Now it chanced that the basket was placed upon a root of acanthus, which, in spring, shot forth its leaves; and as the plant was depressed in its centre by the superincumbent weight, these encircled and twined round the sides of the basket; but being resisted by the angles of the tile, they convolved at the extremities in the form of volutes. This circumstance was observed by the ingenious sculptor Callimachus, as he passed by; and he, struck by the novelty and beauty of the figure, and by its graceful and appropriate shape, devised therefrom a new capital to some columns he had sculptured for Corinth.

66. 'In the whole history of architecture amongst the Greeks (says Lord Aberdeen, in his admirable Introduction to Wilkins' Vitruv. Architec.), nothing was more calculated, at the period of its adoption, to produce a greater revolution in the practice of the art; or which, from its many advantages, has been more universally preserved and admired in modern times, than the use of the arch, constructed on scientific principles. An endeavour, therefore, briefly to ascertain the origin and date of this important invention may not be altogether misplaced. A difference of opinion has prevailed on this question; but, after submitting the subject to a good deal of inquiry and reflection, it appears most probable that the era of the Macedonian conquest nearly coincides with that of the first introduction of this remarkable feature of Grecian architecture. Much has indeed been written to prove that the use of the arch was not only familiar to the earliest artists of Greece, but was even to be traced throughout the yet more ancient monuments of Egyptian labor. In adducing this proof the most obvious mistakes and the grossest blunders have been committed: drawings and engravings of the actual remains of the antiquities of these countries have been referred to; and the wretched cabins of the Arabs, and the towers and steeples of the modern Greeks, have been gravely represented by some as forming part of the ancient temples, among which these fabrics are frequently to be discovered. The selection of those travellers whose accounts are to be received has not always been judicious; to the authority of such writers as Paul Lucas, and some others of his nation, no particle of credit is due: his truth and accuracy are declared by a recent traveller, his countryman, to be only worthy of comparison with the Arabian Nights' Entertainments. In like manner the assertions contained in works of late date, composed under the Roman empire, have been implicitly adopted respecting the nature of buildings which either never had any existence at all, or which had been utterly destroyed long previous to the times in which their pretended descriptions were published. The tales of the hanging gardens of Babylon, of the

labyrinth of Crete, of Lemnos, and of Porsenna, are equally fallacious and incredible. Strabo and Pliny, who undertake the detail of the wonders of these edifices, had no other object in view than to convey the notion of vast and stupendous works; the display of arches and of domes was best calculated in their own day to produce this effect, and accordingly they did not hesitate abundantly to employ these forms in the account of buildings which no one had ever seen.

67. 'In considering this question, it is necessary to keep in mind the difference between an arch constructed of wedge-formed stones whose joints, if prolonged, would meet in a centre; and one produced merely by the gradual projection of horizontal courses of stones until they meet: of this inartificial description examples may perhaps be found in all ages; but, as abundant materials and massive proportions are required in its formation, little was gained by the adoption of this method, and it is therefore rarely seen. The galleries in the walls of Tiryns, as well as the section of the treasury of Atreus, afford us examples of the most remote antiquity; and Mr. R. Smirke has communicated a similar instance of what we may call a Cyclopian arch existing in Italy. It is preserved quite entire, and has formed a gateway in the wall of the ancient city of Arpinum. This arch is somewhat more elaborately constructed, but possesses the same character, and is probably much more recent than the Tirynthian galleries. But it is not only in Greece and in Italy that we find arches of this description: for, as if they were the natural result of the endeavours of a half-civilised people to obtain height and strength in the interior of their buildings, we meet with them equally amongst nations the farthest separated from each other,—in Egypt, and in India, in the rude works of our British ancestors, and even in the monuments of the original inhabitants of the New World. With respect to the arch scientifically constructed, we may safely assert that no specimen is to be met with before the age of Alexander, either in the existing remains of art in Greece, or described in the works of those writers who flourished previously to that period.'

68. The character of the genuine architecture of the Greeks, in their brightest days, in the days of Pericles, of Alexander, and of Phidias, is that of striking grandeur, combined with, indeed we may say produced by, a noble simplicity. Harmony of proportion, the result of a fine taste and a correct eye, together with the most consummate elegance of detail, and a thorough coincidence of parts, united in weaving the charm so justly and so enduringly powerful.

69. The first material used by the Greeks in their sacred buildings was timber; next brick, the art of making which they learned from the Egyptians; subsequently stone was employed, as in the temple of Apollo, built by Amphyction; and, ultimately, the most enduring as well as the most beautiful of all substances applied to the purpose was abundantly introduced, namely, marble.

70. The Greeks carried sacred architecture to its highest point of perfection. In fact, the instances which remain to illustrate the purity and glories of their style may be said, almost every one of them, to fall under this class of the art.

71. As mechanical skill advanced, cubical and oblong stones were devised, by means of which two methods of construction were introduced. The first, called Isodomon, was, as the word implies, with courses of equal length and thickness. The other, Pseudisodomon, admitted of a difference in the heights, or thicknesses, and lengths of the courses. The first method was unquestionably the most beautiful, and consequently used in the grandest of their buildings; the latter obtained where the work was of less importance and executed in a more homely manner. A third mode was still ruder in its character, and denominated Emplecton; in which manner of construction the front stones only were wrought, and the interior left rough and filled in with stones of various sizes, or with rubble. This was chiefly employed in walls of great thickness: those, for example, surrounding cities. Sometimes, they constructed their walls of brick or common stone, and faced them with marble.

72. The Greeks do not appear to have made any great use of cement, the necessity for which was obviated by the size and weight of the blocks, and the precision with which they were squared.

73. A very important observation with reference to the ancient Greek architects, and the consideration of which may serve as a key to some of their most distinguishing excellencies, is that every ornament introduced by them was in concord and harmony not only with the peculiar order employed, but with the character and object of the edifice; to which latter, indeed, the order itself was appropriated. This, if the reader will suffer his imagination to dwell awhile on it, was sure to prove a grand source of beauty. It is calculated to produce in the beholder a sense of pleasure and admiration, which perhaps the mere abstract form of the mass before him is insufficient to account for; and which, if he were studiously to analyse it, would be found to spring from those more latent properties of fitness, of proportion, and of utility, which the structure possessed, and which would necessarily stimulate corresponding ideas or associations in the recesses of the spectator's mind.

74. Again, their external embellishments were bold although simple, and never redundant. The pediment of the temple and the metopes of the frieze were usually (as in the temples of Minerva and of Theseus at Athens, and of Jupiter Panhellenius at Egina), decorated with bassi relievi, and the angles of the walls with pilasters or antæ. Their public squares were commonly surrounded with porticoes, in which were exhibited pictures, statues, and other works of art; and these seem to have been more profusely ornamented than the temples, theatres of declamation, or gymnasia.

75. It would seem, however, that the perfection of architectural beauty which was the pride and ornament of Greece, was in a very considerable degree confined to the edifices devoted to public purposes, and that individuals were restrained by some prescriptive principle, or implied law, from making costly displays of this kind. The feeling

arose probably from an apprehension that it might be deemed incompatible with the apparent equality of the citizens of a democratic state. Demosthenes conceived it to be a reasonable ground of accusation against Midias that he had erected a dwelling at Eleusis which threw all the others in that place into the shade. The same great orator likewise observed elsewhere, that so scrupulous was the public policy in this particular, that even the residences of Miltiades, Aristides, and other illustrious citizens, were quite undistinguishable from the houses of their neighbours. (Demost. Olynth. iii. p. 38, 39.) At the same time he regrets that this salutary regulation had been greatly deviated from in his own age. The city habitations of the Romans, in their earlier and more powerful era, seldom boasted of much exterior architectural embellishment; and Julius Cæsar may be said to have trenched on the old simplicity of his predecessors in more ways than one, since he applied to the senate for a decree enabling him to adorn his house like the front of a temple, and add to it a *fastigium* or pediment; a distinction previously appropriated to the gods alone.

76. The temples of Greece were principally quadrilateral buildings, differing only in size, order of architecture, number of columns, and disposition of porticoes, which either ornamented the front alone or ran round every side. Previously to the Macedonian conquest the Doric order appears to have obtained almost solely throughout Greece and her colonies, as well as in Italy and Sicily; together with one general form of building their temples, varied slightly in particular parts. This general form was an oblong square of six columns by thirteen, or eight by seventeen, enclosing a walled cell, of small proportions, in some instances left open to the sky, in others covered by the roof common to the entire edifice. In fact the system of Grecian architecture, as has been before observed, derives one of its main charms from its graceful simplicity.

77. Almost coeval with the rise and progress of architecture in Greece is the formation of the Etruscan school. The Etruscans are by some antiquarians said to have been originally a Grecian colony; and to have received, as a matter of course, the arts and sciences from the parent state. Whether this be so or otherwise is not much to our present purpose to inquire. It is certain that their architecture possesses peculiarities which entitle it to a separate notice; and it also demands observation from the circumstance of its having been the parent of the Roman style, with which indeed it became, at a very early period of the history of that great people, closely identified, one of the two orders peradded by the Romans (the Tuscan) deducing its name therefrom.

78. The invention of atriæ is one of the distinguishing marks of Etruscan architecture. These are court-yards in front of the houses; and the appellation is said to have been derived from the Etruscan colony of Adria, or Atria, where they were first introduced. Their plan is simple, consisting of a parallelogram, surrounded by a portico, and supported by rough columns.

79. In the most ancient specimens of this school we find abundant use made of the arch, the construction of which was evidently well known to their architects. Their columns differed in shape and proportion from those of any other nation, and Vitruvius has awarded to them the honor of having formed a new order, which however is only a variation, and by no means an improvement on the Grecian Doric.

80. The tomb of Porcenna, king of Etruria, founded by him in the city of Clusium, is recorded in the thirty-sixth book of Pliny's Natural History, as a surprising specimen of their art; which was, however, applied to purposes of greater utility in the construction of the Cloaca Maxima, the Capitol, &c. at Rome. The Etruscans are likewise said to have erected circuses, but of these no traces remain.

81. At a subsequent period of their history the Romans improved on the ruder models which they had adopted from their Tuscan neighbours, by their connexion with Greece itself; and, at a period considerably antecedent to that at which Vitruvius's treatise was composed, they could boast of possessing many good architects. Indeed one of these, Cossutius, was employed by Antiochus, about two centuries before the Christian era, in the construction of a work of first-rate importance (the temple of Jupiter Olympus) at Athens itself.

82. In noticing the best examples of Roman architecture, produced at its most flourishing period, we observe, in addition to the square plans of the Greeks, circular temples crowned with domes. The Corinthian order was evidently the favorite one, and was practised with great skill and success, particularly when not tortured into their own modification of it—the composite.

83. The most prominent features of the pure Grecian style are invention, elegance, and a severe beauty, at the same time not destitute of richness, which has left to succeeding ages the finest models for imitation. If we turn to the Roman school, which succeeded it, we are struck by the display of splendor, vastness of extent, carelessness of expense, and redundancy of ornament. Great caution, however, must be observed in undervaluing their productions. It should be borne in mind that they have never been excelled with regard to scientific construction generally; or equalled in masterly control over the vault, the cupola, and the arch.

84. Their improvements in these branches of the art, indeed, led to the formation of marvellous works. They enabled the architects to whom they were due to uplift in air the pile self-balanced; to throw over the immense area of the Pantheon the pensile vault; and to create those stupendous aqueducts which are amongst the noblest of Roman inventions, and were utterly unknown to the Greeks.

85. In a word—if Grecian architecture, considered as a fine art, must be admitted to have reached the highest point of taste and refinement, we are equally bound to ascribe to the Romans the power and credit of increasing and embellishing the practical comforts of life, and of rendering grandeur and luxury subservient to the daily uses of existence

86. The triumphal arches of the Romans constitute a leading feature in their architecture. In the designing of these nothing was overlooked which might tend to perpetuate the fame of the conquerors. Some were constructed with two, others with three openings. The Forums likewise occupy a considerable place in a review of this style. The Roman Forum, which was the most renowned spot in all the ancient city, exceeded all the rest in size, splendor, and architectural beauty. Of the others, that of Trajan occupies the foremost rank, the Trajan Column forming one of its chief ornaments.

87. The earliest buildings of the Romans were destitute of columns; the greater part of their temples circular and covered with cupolas; as those of Romulus, of Cybele, of Vesta, of Mars, of the Sybils, &c. Even after they had adopted Greek proportions of the orders their old methods of construction were still preserved. The columns, pediments, and cornices, instead of being, as among the Greeks, principal and necessary component parts, were introduced merely as extraneous ornaments. This mistake became the prolific source of abundant affectations and conceits. Vespasian's temple of Peace exhibits a vault of ground arches (a figure in itself sufficiently unsightly), sustained at the springing of each groin by a single Corinthian column, a support, with respect to the vault, as trifling and inadequate as misapplied and absurd. Thus also we find, in the Colosseum and the theatre of Marcellus, sundry stories of arcades, whilst the intermediate piers are adorned with engaged columns, whereby the order, losing its proper character as essential to the building, is degraded into an idle, and consequently meretricious ornament. The Colosseum, indeed, vast and mighty and sublime as it is, even in ruins, has many errors in detail, which our space will not admit of our pointing out.

88. The Romans differed materially from the Greeks in methods of construction. The principal parts of most of their temples, including the body and columns, were formed of small bricks or stones, united by a very strong cement, and cased on every side with different marbles, and those exceeding hard stuccoes produced by their important discoveries in the art of making calcareous cements. These incrustations they adorned with a lavish hand. The pilasters and panels of the second story of the interior of the Pantheon present a specimen of this kind of work, to which the Italians have given the name of *umbratile*.

89. It does not fall within our scheme to pursue the gradual variations in the several species of ornamental architecture, nor to trace in a particular way the decline, and final extinction, of that beauty and grace which appeared for awhile to be inherent in the works of the Greeks and Romans. We must content ourselves with observing that, subsequently to the Macedonian conquest, although the increase of mechanical science in Greece must doubtless have enlarged their facilities of execution, architecture does not seem to have advanced as a fine art. Its most brilliant period, in this point of view, was comprised in the brief space of 200 years, including the respective ages of Pericles and Alexander. From the era of the latter's death its deterioration may be said to have begun. On the transmigration of the arts into Rome the purity of architectural style was, as we have before observed, much more largely encroached on; and this corruption proceeded, with greater or less degrees of rapidity, until every vestige of beauty or propriety was lost in the dreary period which succeeded the incursions of barbarism.

90. When Constantine established the Lower Empire at Byzantium, instead of embellishing the cities with theatres, temples, and works of peace, all the exertions of the architects were engrossed by towers, fortifications, and other military edifices. He however stripped the imperial city of all that could be removed, to adorn his own capital. At a subsequent period when Rome had been sacked by Alaric and his companions, the successor of Constantine repaired and carried away whatever remained of any value, loading several vessels therewith, which being driven into Sicily by a tempest, and their commander killed, the Saracens, then masters of the country, carried their spoils to Alexandria.

91. The Saracens, in their buildings in Egypt, appear to have availed themselves, in a very small degree only, of the style of the aboriginal inhabitants. Their style may be justly regarded as the immediate precursor of the Gothic, and is distinguished by the lofty boldness of its vaultings; the slenderness of its columns; the peculiar mixed form of its curves; the variety of its capitals; and the immense profusion of its ornaments. The greatest peculiarity, however, lies in the small clustered pillars and pointed arches, formed by the segments of two intersecting circles (see plate VIII). The Egyptian Saracenic varies from the Spanish chiefly in the form of the arch, as will be apparent from comparing the gate of Cairo with that of the Alhambra, in Grenada, or the great church at Cordova.

92. The genuine style of Gothic architecture is grand, characteristic, and impressive. What it wants in chasteness and simplicity is made up by solemnity, and a grace peculiarly its own. A Doric temple, as has been justly observed, differs from a Gothic cathedral as Sophocles does from Shakspeare. 'The principle of the one,' says Mr. Hazlitt, 'is simplicity and harmony; that of the other richness and power. The one relies on form and proportion; the other on quantity and variety, and prominence of parts. The one owes its charm to a certain union and regularity of feeling; the other adds to its effect from complexity and the combination of the greatest extremes. The classical appeals to sense and habit; the gothic or romantic strikes from novelty, strangeness, and contrast. Both are founded in essential and indestructible principles of human nature.' The elements of this style are spires, pinnacles, lofty-pointed windows, and elevation, as opposed to the horizontal line of the Greeks. They appear to be derived, in almost every instance, from its type—the pyramid or cone. 'Thus,' as Mr. Elmes observes, 'all we see in it is pyramidal. Its shafts shoot upwards; its arches are shaped like points of lancets; its windows form themselves into pyra-

midal tracery; and it has been not inaptly compared to a grove of trees.' An excellent illustration of the hypothesis of the pointed arch being formed by the intersection of two Roman or semicircular arches, is to be found in the abbey church of Malmsbury, in Wiltshire; an ecclesiastical fabric of great antiquity and beauty.

93. Our own country appears to be the one in which this eminent style of architecture has been practised with the greatest success; and we shall therefore now turn an eye to the progress of the art in England.

94. The Roman style of architecture, there can be little doubt, preceded all others in this island, the primeval cabin or hut alone excepted. The Roman legions were constantly attended by a train of artisans and artists of every description; and they are known to have constructed in Britain a number of convenient and even costly buildings for their own use, and at the same time to have stimulated the natives to copy and rival them. It is true, the stupendous remains of Druidical art, if art it may be called, seem to challenge a belief in the skill and power of the ancient Britons: but it must be borne in mind, that these edifices, although stupendous, were probably extremely simple in plan; and evince a disposition rather to excite the wonder attending vastness of extent, than the admiration which is called forth by regularity, harmony, and system.

95. Soon after the final departure of the Romans from Britain, the purer taste in architecture was wholly superseded by new and vitiated styles; the first of which that demands notice from us is the Saxon. This has been deduced, and not unfairly, from the Roman system, polluted by the barbarisms of the middle ages. It is characterised by round, clumsy pillars and semicircular arches, surmounted by others of a round shape. See plate VIII.

96. The variations of the art in this country may thus be delineated. The first epoch may comprise that space of time between Augustan excellence and the total expulsion of the Romans from the island. The second would commence with the introduction of the Saxon style; the third, with that of the Gothic, including all its varieties, from the plainness of the Norman to the meretricious enrichments of the florid, which latter obtained in all its splendor, until the revival of classical taste in the reign of queen Elizabeth; and the fourth epoch may be dated from that period when Roman, or to speak more correctly, Italian architecture began once more to mingle with our native English style.

97. Another theory has been put forth, that the Saxon churches, after they began to be built with stone, consisted only of upright walls, without pillars or arches, the construction of which, it is alleged, they were entirely ignorant of. But it is highly improbable, that the Saxons could be ignorant of so useful a contrivance as the arch. Many of them, built by the Romans, they must have had before their eyes; and it is not to be believed, that once knowing them and their convenience, they would neglect to use, or, having used, would relinquish them. Besides, as it appears, from undoubted authorities, they procured workmen from the Continent, to construct their capital buildings 'according to the Roman manner;' this alone would be sufficient to confute that ill-founded opinion; and at the same time prove that what we commonly call Saxon is in reality the offspring of Roman architecture.

98. This style of building was practised all over Europe, and continued to be used by the Normans long after their arrival here, so that there seems to be little or no ground for a distinction between the Saxon and the Norman architecture. The ancient parts of most of our cathedrals are of this early Norman work, the characteristic marks of which are these:

99. The walls are very thick, generally without buttresses; the arches, both within and without, as well as those over the doors and windows, semicircular, and supported by very clumsy columns, with a kind of regular base and capital. In short, plainness and solidity constitute the striking features of this method of building. Yet the architects of those days sometimes deviated from this rule. Their capitals were adorned with carvings of foliage, and even animals; (See specimens in Plate VIII.) their massive columns exhibited small half columns united to them, there surfaces were ornamented with spirals, squares, lozenge net-work, and other figures, either engraved or in relievo.

100. Various instances of these may be seen in the cathedral of Canterbury, particularly the under croft, the monastery of Lindisfarn or Holy Island, the cathedral at Durham, and the ruined choir at Orford in Suffolk. The columns, fig. 1, 2, 7, 8, pl. viii. are at the monastery of Lindisfarn or Holy Island. Those marked fig. 3, 4, 5, are in the ruined chancel at Orford, in Suffolk. Fig. 6 is at Christ Church, Canterbury. Fig. 9 is a column with two remarkable projections like claws in the south aisle of Romsey church, Hampshire.

101. With respect to the origin of the pointed arch, a question which has occasioned so many hypotheses, little can be said confidently. Intersecting arches were probably an early, and undoubtedly a very widely spread mode, of embellishing Norman buildings, and were occasionally constructed in situations and with blocks of stone which required centres on which to turn them. Now the construction of such centres could not have proceeded but from the employment of something corresponding to compasses; and thus, even were we to adopt the unlikely supposition that the arches were constructed without previous delineation, the centres must have led to the invention of the pointed arch. If we go, in detail, into the examination of a considerable number of Norman buildings, it will appear that the superior lightness and elegance of the pointed arch, once hit on, was constantly undergoing improvements. In fine, we may remark that the arches arising by necessity in some plans from Norman groining would be pointed.

102. Again, the pointed arch has been imagined to be of Arabian extraction, and to have been introduced into Europe by some persons returning from the crusades in the Holy Land. Sir Christopher Wren was of this opinion; and it has been in fact, subscribed to by most writers who have treated on the subject. Other arguments have been, adduced to prove that this style of

architecture was introduced into Spain by the Moors, and from that country passed by the way of France into Britain.

103. Leaving this point to be decided by antiquarians, we shall proceed to describe more at large the progress of architecture in ancient Britain. It appears from history that, before the Roman invasion, the natives of Britain had no better lodgings than thickets, dens, and caves. Some of the caves, which were their winter habitations, and places of retreat in time of war, were rendered secure and warm by art, like those of the ancient Germans, which are thus described by Tacitus: 'They are used to dig deep caves in the ground, and cover them with earth, where they lay up their provisions, and dwell in winter for the sake of warmth. Into these they retire also from their enemies, who plunder the open country, but cannot discover these subterraneous recesses.' Some of the subterraneous, or earth houses, as they are called, are still remaining in the western isles of Scotland, and in Cornwall.

104. The summer habitations of the most ancient Britons were very slight; and, like those of the Finnians, consisted only of a few stakes driven into the ground, interwoven with wattles, and covered over with the boughs of trees. When Cæsar invaded Britain, the inhabitants of Cantium (now Kent), and of some other parts in the south, had learned to build houses a little more substantial and convenient. They daubed the wattled walls with clay, to fill up the chinks, and make them warmer; and they white-washed the clay, after it was dry, with chalk. Instead of the boughs of trees, they thatched these houses with straw, as a much better security against the weather. They next formed the walls of large beams of wood, instead of stakes and wattles. This seems to have been the mode of building in Britain, when it was first invaded by the Romans. 'The Britons,' says Diodorus Siculus, who was contemporary with Cæsar, 'dwell in wretched cottages, which are constructed of wood, covered with straw.' These wooden houses were not square but circular, with high tapering roofs, having an aperture at the top for the admission of light, and the emission of smoke.

105. At the time of Cæsar's invasion, our ancestors had nothing answering to our ideas of a city or town consisting of contiguous houses, regular streets, lanes, &c. Their dwellings, like those of the ancient Germans, were scattered about the country, and generally situated on the brink of rivulets, for the sake of water, and on the skirt of some wood or forest, for the convenience of hunting and pasture for cattle. As these inviting circumstances were more conspicuous in some parts of the country than others, the princes and chiefs made choice of such places for their residence; and a number of their friends and followers, for various reasons, built their houses as near to them as they could with convenience. This produced an ancient British town, which is described by Cæsar and Strabo as 'a tract of woody country, surrounded by a mound and ditch,' for the security of its inhabitants against the incursions of their enemies. 'The forests,' it is added, 'of the Britons are their cities; for, when they have enclosed a very large circuit with felled trees, they build within it houses for themselves and hovels for their cattle. These buildings are very slight, and not designed for long duration.' The palaces of the British princes were probably built of the same materials, and on the same plan, with the houses of their subjects, and differed from them only in solidity and magnitude.

106. Although the intercourse between Britain and the continent was more free after the first Roman invasion than it had been before, and some of the British princes and chieftains even visited Rome, then in its greatest glory; it does not appear that the Britons made any considerable improvements in their manner of building for at least 100 years after that invasion. For when the renowned Caractacus was carried prisoner to Rome, A. D. 52, and observed the beauty and magnificence of the buildings in that proud metropolis of the world, he is said to have expressed great surprise, 'that the Romans, who had such magnificent palaces of their own, should envy the wretched cabins of the Britons.' But, as soon as the Romans began to form settlements and plant colonies in this island, a sudden and excellent change ensued in the state of architecture. The decline of the art on the abandonment of Britain by the Romans has been already mentioned. All the provinces of the Western Empire, indeed, participated in this decline: a circumstance partly owing to the building of Constantinople, which drew many of the most famous architects and other artificers into the east, and partly to the irruptions and depredations of the barbarous nations. The people left behind in these islands, having neither skill nor courage to defend their numerous towns, forts, and cities, suffered them first to be plundered, and then destroyed, by their ferocious invaders. Thus, the many noble structures with which provincial Britain had been adorned by the art and industry of the Romans were ruined or defaced in a very short time; and the unfortunate Britons were equally incapable of repairing them, or of building others in their room.

107. The most wanton and extensive devastations were those committed by the Anglo-Saxons; among whom it seems to have been a maxim to destroy all the towns and castles which they took from their enemies, instead of preserving them for their own use. It cannot be supposed that a people, who wantonly demolished so many beautiful and useful structures, had any taste for the arts by which they had been erected. The truth is, that the Anglo-Saxons, at their arrival in this island, were almost totally ignorant of these arts; nor did they much improve in the knowledge of architecture for 200 years after their arrival.

108. During that period masonry was quite unknown and unpractised in this island; and the walls even of cathedral churches were built of wood. The first cathedral of York was built of the same materials; and a church of stone was esteemed a kind of prodigy in those times, that merited a place in history. Masonry was restored and some other arts connected with it introduced into England, towards the end of the seventh century, by two clergymen, who were great tra-

vellers, and had often visited Rome, where they had acquired some taste for architecture. These were the famous Wilfrid, bishop of York and afterwards of Hexham, and Benedict Biscop, founder of the abbey of Weremouth.

109. In the other parts of this island architecture was in a still less flourishing state. After the ancient Britons had retired to the mountains of Wales, in consequence of the incursions of the Danes, the spirit of architecture seems to have been almost totally extinct. Such was the poverty of Britain at this period, that a royal residence or palace in Wales, with all its offices, was valued at £5 and 80 pence of the money of that age, equal in quantity of silver to £16 of our money, and in efficacy, to £160! Even the castles in Wales, that were built for the safety of the country, were constructed of the same materials as those of which their palaces consisted; namely, of wands, with their barks peeled off, wrought into wicker in the manner of our baskets! Such were the flimsy materials which formed the side walls of edifices designed for defence even against the attacks of an enemy, and hence it was that the laws required the prince's vassals to come to the building of these castles with no other tool than an axe.

110. The arts of building among the Scots and Picts, at this period, do not seem to have undergone much improvement. In the beginning of the eighth century, however, they began to make some advances, as appears from some edifices yet remaining in Scotland. These buildings are all circular, and so extremely various in style, that they rather seem to be works of different ages and nations, than of one age and country.

111. Architecture, in the twelfth century, received very great improvements, in consequence of the religious zeal of the clergy, who inspired all ranks of people with an ardor for pulling down the old churches, and building more elegant and splendid ones in their stead. In the time of Henry I. all the ancient edifices that had been raised in the days of Edgar, Edward, &c. were demolished, and others of greater magnitude and magnificence, and of more elegant workmanship, erected. A similar spirit pervaded Scotland, in proportion to its extent and riches. King David I. alone, besides several cathedrals and other churches, built no fewer than thirteen abbeys and priories, some of them very magnificent.

112. The sacred architecture of the Anglo-Normans in the beginning of this period, did not, as has been already noticed, differ much in its style and manner from that of the Anglo-Saxons: their churches being in general plain, low, strong, and dark; the arches both of the doors and windows semicircular, with few or no ornaments. By degrees, through much practice, our architects, who were all monks or clergymen, improved in their taste and skill, and ventured to form plans of more noble, light, and elevated structures, with a great variety of ornaments; which led to that bold magnificent style of building commonly called the Modern Gothic.

113. It is not improbable that our monkish architects were assisted in attaining this style of building by models from foreign countries, or by instructions from such of their own number as had visited Italy, France, Spain, or the East. Its first appearance in England was towards the latter end of the reign of Henry II. But it was not at once thoroughly adopted, some short solid columns and semicircular arches being retained and mixed with the pointed ones. In the reign of Henry III. however, this manner of building seems to have gained a complete footing; the circular giving way to the pointed arches, and the massive pillars giving place to the slender columns: and such was their passion for this fresh taste that many of their strong ancient buildings were pulled down, and re-constructed after the model of the new architecture.

114. The present cathedral church of Salisbury was begun early in this reign, and finished in 1258. Its style is Saracenic, and according to Sir Christopher Wren, it is one of the finest productions of architecture of the age in which it was built. It is built on one entire plan, and at one time, by which it distinguishes itself from some other cathedrals, which have been built at different periods, and in various styles. From this time till Henry VIII. the fashionable pillars were of Purbec marble, very slender and round, encompassed with marble shafts a little detached, having each a capital adorned with foliage, which, joining, formed one elegant capital for the whole pillar. The windows were long and narrow, with pointed arches and painted glass. In this century lofty steeples, spires, and pinnacles, were much the taste in building churches.

115. In the fourteenth century, pillars consisted chiefly in an assemblage of shafts not detached, but united, forming one solid and elegant column. Their windows, especially those of the east and west ends, were large, and divided by stone mullions running into ramifications above, and forming numerous compartments in various fanciful shapes. Those windows were filled with stained glass of the most lively colors, on which were represented kings, saints, and martyrs, and their histories. Yet, notwithstanding the perfection to which architecture had attained in these instances, this art, as applied to common dwelling-houses, did not receive a proportionate degree of improvement, if any at all; for even in the city of London, towards the end of the twelfth century the houses of mechanics and common burgesses were built of wood, and covered with straw or reeds.

116. Towards the close of the reign of Henry VII. a new kind of low pointed arch was much in use. It was described from four centres, (see Plate VIII), was very round at the haunches, and the angle at the top was very obtuse. This sort of arch is to be found in all cardinal Wolsey's buildings; also at West Sheen; an ancient brick gate at Mile End, called King John's Gate; and in the great gate of the palace of Lambeth.

117. The later style of Gothic architecture, the progress of which we have just traced, has been more particularly subdivided into the Early English, the Decorated English, and the Perpendicular English.

118. The first-mentioned style, immediately superseding the Norman gothic, extended to the reign of Edward I. in 1307. Its peculiar cha-

racteristics are pointed arches, and narrow long windows without mullions; to these may be added a singular kind of embellishment, somewhat resembling the teeth of a shark.

119. The second, or Decorated English, obtained until the conclusion of Edward the Third's reign in 1377, and probably a little later. This style is peculiarised by very large windows, having pointed arches divided by mullions: the tracery does not run perpendicularly, but in undulating lines which describe arches, circles, and other figures: the ornaments are numerous, and carved with great nicety.

120. The Perpendicular English seems to have been practised, in the way of additions to buildings, even down to the middle of the seventeenth century, although the most recent complete edifice fairly belonging to it is of the age of Henry VIII. The essential features of this style are clearly expressed by its title, the mullions of the windows and the ornamental pannellings running in perpendicular lines, and thus forming a variety radically opposed to the manner last mentioned. The carvings in these buildings are commonly executed with great delicacy and beauty; but an injudicious profusion of ornaments often interferes with the gracefulness and boldness of the design.

120. We will here make some mention of two singularly constructed towers which have hitherto received but little notice; namely, that of the old church of St. Peter's, at Barton in Lincolnshire, and that of Clapham church, in Bedfordshire. We have already taken occasion to observe, that the Saxon and early Norman styles are so blended that it is almost impossible to distinguish them; and indeed extremely doubtful whether any genuine specimens of the former still exist to exemplify or disprove the position. The towers now alluded to, however, certainly bear the appearance of being, at least in part, of real Saxon workmanship.

121. The first is short and thick, with extremely thick walls, originally of three stages; the two lower of which are adorned with perpendicular stripes of stone, projecting from the face of the wall, and breaking into arches near the top of each stage; the lower set of arches semicircular, and the perpendicular lines springing from a stone set on the top of the arch. The second set are straight-lined arches, running up to a flat string or tablet, on which is the third plain stage with but two small arches, as in the second stage. On the summit of these three stages is another, plainly belonging to the early Norman style, having in it a double Norman window with shaft and capital in the centre. Now this stage being clearly Norman, from which the whole arrangement of the substructure so widely differs, we are led to infer that it was an addition to the original building. At about 150 yards' distance stands the new church of St. Mary's, a Norman edifice, with an early English tower and chancel, and a very early decorated east window; which style in the new building certainly throws us back at all events to the Conquest for the date of the old one.

122. The other tower in question, namely that of Clapham church, in Bedfordshire, is noticeable chiefly for the extraordinary simplicity and even rudeness of its construction. It consists of a square tower, destitute of tablet or buttress, of the height of three squares or thereabout, with a rude round arch door, and over it two heights of small round arched windows. Above this part, with a plain set-off inwards, is a Norman portion with a Norman window, separated into two divisions by a central shaft, plain, and of early character, which portion is surmounted by a battlement and cornice of later date.

123. There appears to have existed a disposition in the architects who succeeded the Normans to preserve the doors of their predecessors; and to this tendency do we owe the many noble although roughly-finished specimens of ability in that way now remaining. This door has a semicircular arch, and the numerous bands of moulding, increasing the depth of the arch, produce an effect at once bold and rich. In those cases wherein shafts are employed, an impost moulding is generally introduced above them, before the spring of the arch mouldings. These are usually much ornamented; and among the ornaments we almost constantly find that of a zigzag or waving form, together with a large round moulding with heads on the outer edge partly projecting over. The exterior moulding, in many instances, descends no lower than the spring of the arch, in this way forming an apparent dripstone; the door itself is sometimes square, and the interval to the arch filled with carvings. Iffley-church, near Oxford, is probably the best example of the Norman door, as it contains three specimens, each differing from the other: the south door, indeed, is almost unique, from the flowers in its interior mouldings. The cathedrals of Durham, Rochester, Ely, Worcester, &c. possess likewise fine Norman doors. The Norman windows, which, except in buildings of considerable extent, are generally small, may be termed, as regards their ornaments, diminutive doors. The doors of the early English style, if we except some small interior ones with flat tops, may be said to have uniformly the pointed arch.

124. The Norman towers were short and thick. The steeple was mostly a massive tower, not often rising beyond a square in height, (if so much) above the roof of the building to which it belonged. The early English towers and steeples shot up to a far greater height, and were surmounted by the elegant and heaven-pointing spire, some of the most admirable specimens of which belong to this age. The spire of Salisbury cathedral, which 'dallies with the clouds,' and fascinates the eye of the traveller while distant many miles, must altogether be included in the early English style; although many of its ornaments seem to refer its erection to the period at which that was superseded by the decorated. Wakefield steeple is also beautifully proportioned, and remarkable for its machicolations in the top of the tower.

125. The general character of early English building is magnificent: its richness arising from the number of parts rather than from its details. In the structures which contain very long windows, great effect is produced by the loftiness of

the divisions; in lesser buildings great simplicity of appearance is obtained. In the subsequent styles there are abundant evidences of inferior workmanship. In this, on the contrary, the artificers seem to have acquired the utmost perfection of skill.

126. The early English style has not been, in any great degree, either imitated or restored, although it is undoubtedly very applicable to country churches, and may be worked almost entirely plain. If the transition was gradual from the Norman style to the early English, that from the latter to the decorated was still more so; and several examples of this transition on an extensive scale remain. Westminster Abbey has been justly considered early English in almost all its parts; but the cloisters present many indications of gradation. A very beautiful specimen of accommodation between the two styles is exhibited in the lady chapel at Lincoln, which is obviously decorated, yet in such a taste as to blend most harmoniously with the antecedent manner by which it is surrounded.

127. Perhaps the clearest marks of the decorated style are to be sought for in the shape and ornament of the windows, which are extremely various, although all on one principle. An arch is separated by one or more mullions into several lights, and these mullions run into tracery of different kinds, but not in perpendicular lines, through the head. In small churches it is not unusual to find windows of two or three lights: whilst in those of a larger description four or five lights for the aisles and clerestory windows; five or six for transepts and the ends of aisles; and seven, eight, or nine for the east and west windows, are found. The east window of Lincoln cathedral, and the west window of York, have each eight lights; whilst the west window of Exeter and the east window of Carlisle cathedrals are of nine; almost, if not quite, the largest windows remaining. Two branches of tracery may be observed. In the first the circles, trefoils, quatrefoils, &c. are all worked with the same mouldings, by no means regularly joining each other, but often touching at parts only. This species of tracery may be denominated geometrical; and of this description are the windows of the nave of York, the eastern choir of Lincoln, the greater part of the windows of Exeter, and a good deal of the tracery in the cloisters at Westminster-abbey. The second branch may with great propriety be designated flowing tracery. York-minster, Newark-church, the Minster, and St. Mary's at Beverley, together with several southern churches, exhibit very beautiful examples. In the richer windows of this style, and in both branches, the chief moulding of the mullion has occasionally a capital and base, thus becoming a shaft.

128. As the term decorated is employed to particularise this style, and as that which succeeded it has been denominated, *par excellence*, florid, which would seem to imply that it was still richer in embellishment, it may be as well to state that the ornaments of this department of English architecture, like those of Grecian purity, may be omitted without prejudice to the main design of the edifice; whilst those of the perpendicular style consist more frequently of a minute division of parts of the building, of pannels, for instance, buttresses and such like. Thus, in some of the more splendid decorated structures, although a profusion of flowered carvings is displayed, yet no effect of overloading is perceptible; while, on the other hand, some of the later perpendicular buildings, with much less flowered carvings, still appear crowded with ornament from the offensive subdivision into minute parts, which interferes with, and obscures the harmony of, the general plan.

129. A great number of edifices in the perpendicular style appear to have been erected in the reign of Henry VII., one of the most celebrated of which is the chapel which takes the name of that prince. The main source of ornament in this style is pannelling. In fact, the interior of most rich buildings presents a regular series of it. King's College, Cambridge, is all pannel, except the floor; the doors and windows being nothing else than pierced pannels, included in the general design, and the roof itself a series of them of various shapes.

130. The number of buildings of the perpendicular style now in a state of the best preservation is uncommonly great. Amongst the specimens of the earliest date is the choir at York; which, although in its general arrangements resembling the nave, is decidedly of perpendicular character, if we consider its ornaments, the windows, and the gallery underneath them, or the interior pannelling. Of a later date, are the three most tasteful specimens of the style, King's College; Henry VII.'s Chapel; and St. George's, Windsor. The adornments of these are distributed with an unsparing hand; and whilst the buildings partake of one general character, enough of diversity is exhibited. Great variety of composition distinguishes St. George's. In the King's College chapel the roof and line of wall demand particular notice; and the details of Henry VII.'s, from their delicate richness, will ever excite the warmest admiration.

131. With respect to old buildings of a domestic nature, it is impossible to give any confident account, since none remain unaltered, if at all, of an early date. Hampton Court, in the county of Hereford, is probably one of the most ancient specimens. It is the family seat of lord Coningesby, and was built by king Henry IV. when Duke of Hereford, about 400 years ago. It was restored and repaired, about 100 years since, by the then lord Coningesby, at considerable expense; the house, at that time, contained seven noble state apartments, magnificently furnished, together with numerous convenient private dwelling rooms:—there were fine gardens, a large park, and noble demesnes; a well-stocked decoy, and every other desideratum.

132. With the decline of the perpendicular style Gothic architecture generally declined, and was soon after supplanted by a mixed style, if we may venture to call it so; wherein the Grecian and Gothic, however discordant and irreconcileable, were jumbled together. Concerning this mode of building Mr. Warton remarks, that 'although the Roman or Grecian architecture did not begin to prevail in England till the

time of Inigo Jones, yet our communication with the Italians, and our imitation of their manners, produced some specimens of that style much earlier. Perhaps the earliest was Somerset house in the Strand, built about the year 1545, by the duke of Somerset, uncle to Edward VI.' In 1613 the magnificent portico of the schools at Oxford was erected, in which, along with the old Gothic style, the architect has affectedly displayed his skill in the Grecian and Roman architecture; and has introduced all the five orders together.

133. One of the most memorable events in the general history of modern architecture, is the establishment, about the year 1400, of the academy at Florence, which comprised many persons of first-rate talent, who, by examining the magnificent ruins of ancient Roman art, once more upraised architecture from the long abasement into which she had been plunged.

134. Among the earliest works of this academy was the celebrated church of Santa Maria da Fiori, at Florence, an edifice originally designed by Arnolfo, assisted by Laurentio Ghiberto, by profession a goldsmith and sculptor. He leaving it unfinished, it was taken in hand by Filippo Brunelleschi, born in 1377, who may be regarded as the founder of the modern classical style. Having prepared his mind by a careful study of the writings of ancient authors, and of the ruins of Roman edifices, he discovered the proportions of the orders, and, impressed by a deep sense of the simple gracefulness of the ancients, struck out a system upon lasting principles.

135. By this architect was erected the cupola of the church before mentioned, an undertaking beyond the abilities of any other individual then living. This cupola, rising from an octangular plan, is of great elevation, inferior in size only to that of St. Peter's, at Rome. In consequence of the performances of this accomplished architect, a study was commenced of the writings of Vitruvius, and taste again began to diffuse itself amongst the long benighted Italians.

136. Leo Baptista Alberti, and Bramante, both followed in the footsteps of Brunelleschi, and contributed to the advancement of restored art. The former is rendered eminent by his excellent treatise on architecture, which procured for him the title of the modern Vitruvius. To the latter Pope Julius II. committed the execution of his superb project for the rebuilding of St. Peter's; and it was he who conceived the idea of surmounting that gigantic structure with its lofty pyramid. Raffaelle, San Gallo, and Michael Angelo, were successively engaged in this stupendous work; and to the latter, who excelled equally as painter, sculptor, architect, and poet, its completion is principally attributable.

137. In the sixteenth century architecture was practised with uncommon success by the great masters, Vignola, Serlio, Palladio and Scamozzi; and the list may be almost said to close with Bernini, who flourished in the seventeenth century.

138. In the neighbouring country of France, the first architect who abandoned the Gothic for the revived antique style, was Pierre Lescot, who flourished in the commencement of the sixteenth century. About the same age lived Philibert de Lorme, who had studied the antiquities of Rome, and wrote on the art, as well as practised it. But perhaps the greatest architectural genius that France has produced, was François Mansart, born in 1598. One of this artist's chef-d'œuvres is the chateau de Maisons, near Saint Germains. He would have been a still more able artist, had he possessed consistency and stability, as well as genius; but the want of this virtue not only rendered his works inharmonious, but kept him from being employed on several important undertakings Jules Hardouin Mansart, nephew of the preceding, was Louis XIV.'s principal architect, and executed the chief works of that splendid reign; among his best performances are the palace of Versailles, St. Cyr, and more particularly the place and church of the invalids.

139. The façade of the Louvre, one of the most beautiful specimens of modern architecture, was the work of Claude Perrault. Blondel, born in 1617, is celebrated for his knowledge of the sciences, and of the theory of architecture. His most famous building is the port St. Denis. If to these we add the eminent name of Soufflot, architect of the church of St. Genevieve, which has been denominated the pantheon of Paris, we shall have mentioned the most conspicuous among the modern followers of the art in France.

140. The Roman, or rather Italian, style of architecture, as adapted to domestic purposes, was first introduced amongst us in a systematic manner by Inigo Jones, whose masterpiece of Whitehall chapel, although faulty in detail, as well as his magnificent works at Greenwich and Covent Garden, suffice to establish his reputation in the very first class of English artists. Sir Christopher Wren, an eminent mathematician and philosopher, whose enlightened mind had devoted its treasures to the pursuit of architecture, followed; and to him we stand indebted for most of the finest public buildings which embellish our metropolis. This great man had, on receiving from Charles II. the appointment of royal architect, entered on a tour through France to Italy and Greece; but had not proceeded beyond the first-mentioned country, when he was recalled by intelligence of the fire which desolated London.

141. Wren, it should be remembered, was not regularly educated as an architect. Perhaps, on the whole, his taste did not exceed Jones's; but in the science of construction he stands unrivalled. St. Paul's cathedral, the architectural glory of our metropolis, was the undivided product of this great man's mind. Yielding to no other modern temple, except St. Peter's, in magnitude, it surpasses that sublime building in unity of plan and consequent completeness of effect, as well as in masterly execution. St. Stephen's, Walbrook, is ingenious and novel, though its purity of taste may be questioned; but no hesitation need be felt in speaking of the spire of Bow church as the most perfect thing of the kind, taken altogether, known either in this country or on the continent.

142. Vanbrugh was contemporary with the

latter portion of Wren's career; and unquestionably produced several works indicative of great power and grasp of imagination. His mind was evidently attracted by the genius of gloomy grandeur; and was utterly unable even to apprehend the graces of lightness and elegance. Thus his structures impress the beholder with a sensation of ponderosity and stateliness by no means consistent with the idea of comfort or ease. His houses seem calculated to be the abode only of 'privileged dullness;' and even the magnificence of Blenheim fails to tempt the gazer to enter within its walls. This character of style is strange enough, too, when we reflect on the social nature of the architect, on his lively comedies, and accomplished table-talk. The epigrammatic epitaph on him, by the caustic Swift, although well-known, is so very happy, that, as it possesses the additional merit of brevity, we will subjoin it:

> Lie heavy on him, earth! for he
> Laid many a heavy load on thee.

143. In proceeding to the consideration of the actual existing state of architecture amongst us, we must not omit to notice, by the way, the distinguished names of Lord Burlington, of Kent, of Gibbs, and of Hawksmoor (the pupil of Wren). From the period at which they flourished, to the nomination of Sir William Chambers, as royal architect, in the early part of the late reign, nothing presents itself worthy of remark. Chambers was an able man, originally a naval officer; and although not qualified to improve either the practice or theory of the art to which he afterwards dedicated himself, at least had sufficient judgment to 'eschew the evil, and choose the good,' as abundantly appears from a perusal of his work on Civil Architecture, with the exception of that part wherein he undervalues the pure Grecian style, which he does not appear to have understood. We cannot forget, however, that to Sir William is owing the introduction of the barbarities of Chinese taste, which was most likely regarded by him as a sort of spurious bantling for which he had contracted an affection in travelling among the savages of that unpicturesque land.

144. We have now arrived towards the conclusion of our rapid sketch, and have brought the consideration of the subject down to a period immediately connected with our own. The scientific and tasteful Wyatt, having enriched his natural genius by contemplation of the spirit-stirring relics of antiquity, returned to engraft upon the talent of his fellow-countrymen a purity of taste, and a relish for the best classical models, never before spread amongst them. Nor did he stop here, but extended his regards to the architecture proper to the land; and evidences of his masterly hand are to be fouud not only in the houses, villas, and mansions, with which he has adorned the face of the country, but in finely-conceived restorations of such venerable piles as Salisbury cathedral and Windsor castle.

145. Our late, and present monarch, have been (and we feel proud and happy in saying that the latter still is), munificent patrons of the arts. From the foundation of the Royal Academy, and other works of princely encouragement, has sprung up a set of men well calculated to do honor to the national taste, and to elevate the character of British art. Holland, Dance, Mylne, Soane, Harrison of Chester, Wilkins, Smirke, Gwilt, Savage, Nash, &c. are names which warrant us in feeling a sensation of great pleasure at the degree of fruition, and the still greater degree of promise, presented by the existing condition of British architecture.

146. The recent improvements in the metropolis have been principally entrusted to the architect last mentioned; and, whatever difference of opinion may exist with respect to particular portions, it must be admitted that their general effect is noble and striking. The sweep of that line of buildings commonly known by the appellation of 'the new street,' and comprising Regent-street, the Quadrant, Waterloo-place, &c. is extremely bold and magnificent; whilst a genuine artistical display is exhibited by the variety of elevations on either hand, which prevent the vapid appearance of mere isolated houses, and give to each different range the harmonious effect of an extensive and ornamental façade.

147. Within the last ten years, indeed, a great deal has been done towards the architectural embellishment and advantage of the capital. Whole neighbourhoods of narrow streets and smoky houses, the haunts of depraved and lawless characters, have been cleared away, and their places supplied by spacious and handsome rows of buildings. Nor must we omit to allude to the princely structures rising in such quick succession to grace the enclosure and boundary of the Mary-le-bone Park, and which, being erected by the government, are unexcelled both in material and workmanship. This vast space is, in fact, to be belted with groups of these mansions, the elevation of each group to have the effect of one palace; and those which are finished give a satisfactory earnest of the splendid spirit in which the whole is to be accomplished. We need not hesitate to say, that there will be nothing equal to it in Europe. The separate villas in the interior of the park are planted out from the view of each other, so that the inhabitant of each seems in his prospect to be lord of the surrounding picturesque scenery.

148. Until these undertakings, our domestic architecture appeared selfish and exclusive. Windows undecorated externally, and calculated solely to afford air and light to the interior; and doors placed in square brick holes, whose only service seemed to be to shut out the stranger;—such were the most observable features of modern English domestic buildings. It is time that this reproach should be wholly removed; and the liberal administration of the present government, seconded by the ability of their chief architect, has prepared the way for its being so.

149. Among recent English works of a public nature, the portico of Covent-garden theatre, imitated in form from the tetrastyle portico of the Agora at Athens, but copied in detail from the temple of Minerva-Parthenon, is probably the most chaste in style, though that style is too severe and heavy for the nature of the fabric to

which it is applied. The Ionic portico to the house of the Board of Control is one of the purest and best applied in London, and is taken from the Ilyssus. Another exquisite specimen of the same order is in a chapel near Grosvenor Place, designed by Smirke.

150. On the whole we are delighted to see that our noble city, already unrivalled in population, commerce, and wealth, bids fair to become, at no great distance of time, equally conspicuous for its glories of architectural display; and that the seeds of a fine and correct taste are rapidly spreading throughout the whole nation, 'bringing forth fruit after their kind.'

PART II.

OF THE FIVE ORDERS OF ARCHITECTURE.

Sect. I.—Of the several Parts and Members of an entire Order.

151. The principal parts of an entire order are three; the pedestal, shaft, and entablature. Each of these are again subdivided into three smaller parts: the pedestal contains the plinth, the dado, and the cornice. The column includes the base, the shaft, and the capital. The entablature consists of an architrave, a frieze, and a cornice. These names require illustration.

152. 1. The *plinth* takes its appellation from πλινθος, a brick or flat square stone, on which columns in the most early state of architecture are supposed to have stood. 2. The *dado*, or *dye*, is so called because it is of a cubic form. 3. The *cornice* is derived from coronis, a top or summit; because the cornice is the extreme end or finishing of the pedestal. 4. The *base* of the column is from βασις, a foundation or footing for the column. 5. The *shaft*, that long and straight part of a column comprehended between the base and capital, is so named from σκαπτω, to dig, in the manner of a well, round and deep, whose inside resembles the shape of a pillar. 6. The *capital*, from κεφαλη, or caput, the head, which the capital is to a column. 7. The *architrave*, from αρχος, chief or principal, and trabs, a beam, because the architrave is the chief support to the whole entablature. 8. The *frieze* is so called from φιβρον, a border or fringe, which some of the ancients used to call ζοφορος, because their friezes were usually enriched with the figures of animals. 9. The *cornice* of the entablature, or the crowning part of the entire border, is explained above.

153. These nine principal parts of a complete order, the dado and shaft excepted, are composed of small members, which constitute all that simple and pleasing variety of mouldings which adorned the works of the ancients. The names of these mouldings allude to their forms, and their forms are adapted to the purposes for which they were intended.

154. The names of the members, with their origin and use, are as follows:

1. The *fillet*, from the French word fil, thread.

2. The *cymatium*, or cyma recta, from κυματιον, a wave; because this member resembles the swelling and concavity of a wave.

3. The *cyma reversa*, the preceding member inverted.

4. The *corona*, or crown, because it is the principal member of the cornice, and serves as a shelter to the smaller mouldings of the entablature.

5. The *ovolo*, from ovum, an egg; because this member by the ancients was frequently carved in the form of an egg.

6. The *cavetto*, from cavus, hollow.

7. The *capital*, or upper fillet of the triglyph.

8. The *triglyph*, from τριγλυφος, three engravings, compounded of τρι, three; and γλυφω, to carve or engrave; in conformity to which the triglyph has two entire channels, and two half ones, with three spaces between.

9. The *metope*, from μετοπη, the space between one aperture or hole and another; the triglyphs being supposed to be joists that fill the apertures: hence the space between the triglyphs, which forms an exact square, is termed the metope.

10. The *frieze* is explained above, sect. 152.

11. The *band* is the same as the fillet.

12. The *guttæ*, or the *drops*, are of a conic figure.

13. The *architrave*. See the explanation, sect. 152.

14. The *facia*, or face; of these there are two in the architrave.

15. The *abacus*, from αβαξ, a shelf or table; or, as some suppose, a tile, on which the ancient Greek mathematicians strewed dust, to draw their geometrical schemes on.

16. The *ovolo* of the capital, which in this situation must be considered as the basket round which the acanthus grew.

17. The *annulets*; so called because these small fillets encompass the capital, like rings joined to each other. The moderns, in place of these, generally have a small cavetto.

18. The *colorino*, the collar, or neck of the capital.

19. The *astragal*, from αστραγαλος, a bone of the heel, or the curvature of the heel, which this member resembles. The hollow which follows is termed αποφυγη, the *escape*, because this part of the column appears to fly off.

20 and 21. The upper and lower *torus*, from τορος, a cable, which this moulding somewhat resembles.

22. The *scotia*, from σκοτια, darkness; because of the strong shadow which its concavity produces, and which is increased by the projecting torus above.

155. In some of the Doric entablatures are *mutules*, from mutuli, modillions, which are placed perpendicularly over each triglyph, and are of the same width; and whose projection in the corona is the same, forming a perfect square. In others are *dentiles*, as in the theatre of Marcellus at Rome. These are so named from dentes, teeth, which they resemble; and the flat members on which these dentiles are placed is termed denticulus. The capitals of the Ionic, Corinthian, and Composite, (See plate II.) have

each of them *volutes*, so called from volutum, to roll round, as on a staff. Some call the volutes the *horns* of the capital, because they resemble the twisting of rams' horns.

156. Those parts of the different orders properly termed *mouldings*, are only eight in number. (See plates IV. & IX.) viz. The scotia. The fillet or cincture to bind the parts. The astragal also and torus, resembling ropes or cables, are strong builders and fortifiers of the parts with which they are connected. The ovolo is strong at its extremities, and is therefore fit to support projecting parts. The cyma recta, inversa, and cavetto, are covering mouldings, which serve to shelter the other smaller members. There are various methods of describing the contours of these; but the simplest, and perhaps the best, is to form them of quadrants of circles.

157. An assemblage of what are called essential parts and mouldings is termed a *profile*. The most perfect profiles are such as are composed of few mouldings varied in form and size, and so disposed that the straight and curved ones succeed each other alternately. When ornaments are employed in mouldings some of them should be left plain, in order to give a proper repose; for when all are ornamented the figure of the profile is lost.

Sect. II. Of the Diminution of Columns.

158. The ancients, in effecting the diminution of the shaft of a column, adopted a variety of methods; beginning sometimes from the foot of the shaft, and at others from one quarter, or one third of its height; the lower part being perfectly cylindrical. The former of these was most in use amongst the ancients; and, being the most natural and graceful, ought to have the preference, though the latter has been more universally practised by modern artists.

159. M. Auzoult is of opinion, that the first architects probably made their columns in straight lines, in imitation of trees; so that their shaft was a frustum of a cone; but, finding this form abrupt and disagreeable, they made use of some curve, which, springing from the extremities of the superior and inferior diameters of the column, swelled beyond the sides of the cone, and by that means gave a more pleasing figure to the contour.

160. Vitruvius mentions this practice, but in an obscure and cursory a manner that his meaning has not been understood; and several of the modern architects, intending to conform themselves to his doctrine, have made the diameters of their columns greater in the middle than at the foot of the shaft.

161. Leon Baptista Alberti, and others of the Florentine and Roman architects, have carried it to a very great excess; for which they have been justly blamed, as it is neither natural, reasonable, nor beautiful. M. Auzoult observes that a column, supposing its shaft to be the frustum of a cone, may have an additional thickness in the middle, without being swelled there beyond the bulk of its inferior parts; and supposes the addition mentioned by Vitruvius to signify nothing but the increase towards the middle of the column occasioned by changing the straight line, which at first was in use, for a curve.

162. This supposition is extremely just, and founded on what is observed in the works of antiquity; where there is no instance of columns thicker in the middle than at the bottom, though all have the swelling hinted at by Vitruvius, each of them being terminated by curves; some granite columns excepted, which are bounded by straight lines; a proof, perhaps, of their antiquity, or of their having been wrought in the quarries of Egypt.

163. M. Blondel, in his work entitled Resolution des Quatre Principaux Problemes d'Architecture, teaches various manners of diminishing columns; the best and simplest of which is perhaps by the instrument which Nicomedes invented to describe the first conchoid; for this, being applied at the bottom of the shaft, performs at one sweep both the swelling and the diminution; giving such a graceful form to the column, that it is universally allowed to be the most perfect practice hitherto discovered. The columns in the Pantheon, accounted the most beautiful among the antiques, are made in this manner; as appears by the exact measures of one of them to be found in Desgodetz's Antiquities of Rome.

164. To give an accurate idea of the operation, it will be necessary first to describe Vignola's method of diminution, on which it is grounded. Having determined the height of the shaft, draw a line indefinitely from D (Pl. IX.) through C, perpendicular to the axis O P of the column; take then I D, half the inferior or largest diameter of the column, and place one foot of the compasses exactly on the extremity of the superior or smallest diameter, as at R, and depress the other, till it come into the axis or centre line of the shaft, as at S under O; through these two points draw a line indefinitely and produced till it cut the line D C, as at A; from A, the centre, draw any number of lines through the axis O P, as S, *r*, S, *r*, &c.; and on each of these place half the larger diameter of the shaft set off from the axis or perpendicular line O P, through which points, thus found, if a curve line be drawn, it will describe the swelling and proper diminution of the column.

165. Although this method be sufficiently accurate for practice, especially if a considerable number of points be found, yet, strictly speaking, it is defective; as the curve must either be drawn by hand, or by applying a flexible rule to all the points; both of which are liable to variations. Blondel, therefore, to obviate this objection, after having proved the curve passing from O to R through the points *r*, *r*, to be of the same nature with the first conchoid of the ancients, employed the instrument of Nicomedes to describe it; the construction of which is as follows: This instrument is made of wooden lathes in the triangular form described by PO, PC, and ABR, (Pl. IX.) the base and perpendicular of which are joined together at P, and has a stay: the upright O P has a groove cut in it. (see the fig.) To the lath A B R at S is fixed a button, (see the fig.) which passes along the groove from P to O; in the moving lath A B R

is a common groove, cut through from A to B; and at A, in the lath D C, is fixed a button at the centre A, as described in the first method. The length of the groove A B must exceed the difference of the length A S to A P; consequently, as the bottom S works in the groove O P, the groove A B permits it to move forward to P, by which the former swelling and diminution will be most correctly performed when a pencil is fixed at R, at a distance from the button S equal to half the largest diameter of the column.

165. It must be owned, that if the centre were moved considerably towards P, this method would not describe a perfect curve or an agreeable diminution; for, in this case, the curve at the top of the shaft will proportionally approach to a straight line, and at last almost become an inverted curve. This, however, is no reasonable objection to the use of the instrument when applied to the diminution of columns; for the greatest quantity of diminution that can in any case be allowed, will not have the least perceptible effect on the curve; and therefore we may venture to affirm, that no other method yet discovered, nor any other instrument that can be invented by man, is likely to exceed it. It is farther to be observed, that Nicomedes's instrument may be made to answer shafts of any dimensions, by making the respective grooves capable of extension by the use of sliders and movable centres, which any architect is capable of contriving. In the remains of antiquity the quantity of diminution is various; but seldom less than one eighth of the inferior diameter of the column, nor more than one sixth. The last of these is esteemed the most perfect by Vitruvius; and is generally adopted by modern architects.

Sect. III.—Of the Origin, Character, Use, and Proportions of the Doric Order.

166. The Doric order, as has been already noticed, obtained its name from the Dorians, a nation of ancient Achaia, from whom it unquestionably received those parts and proportions, by means of which it has been distinguished from subsequent orders. The character of the Doric is robust and masculine, and it has hence been termed the Herculean order. Accordingly the ancients used it almost exclusively in their temples dedicated to Juno, Minerva, Hercules, or Mars.

167. From its peculiar character, this order is well calculated for town-halls, gates of cities, and other public buildings destined for purposes of utility rather than ornament. Among the ancients it was almost uniformly executed without a base. Vitruvius is of opinion that the base was first introduced in the Ionic order, and designed to imitate the sandals worn on women's feet. Scamozzi, on the other hand, vindicates the use of a base to the Doric column; and he has with him the opinion of most modern practisers of the art.

168. De Chambrai has observed that the Doric column is constructed on the model of a strong man, who is always represented barefooted. In conformity with this notion, he generally remarks, that the base to a column stands in the place of a shoe to a man. Le Clerc admits that the most ancient Dorics were without bases; but I must own (says he) I cannot consider a column without a base, in comparing it to a man, but I am at the same time struck with the idea of a person without feet rather than shoes, for which reason I am inclinable to believe, either that the architects of antiquity had not yet thought of employing bases to their columns, or that they omitted them in order to have the pavement clear; the angles and projection of bases being stumbling blocks to passengers, and so much the more troublesome, as the architects of those times frequently placed their columns very near each other; so that had they been made with bases, the passages between them would have been extremely narrow and inconvenient; and it was doubtless for the same reason that Vitruvius made the plinths of his Tuscan columns round; that order, according to his construction, being particularly adapted to servile and commercial purposes, where convenience is preferable to beauty. However this be, persons of good taste will grant, that a base not only gives a graceful turn to the column, but is likewise of real use, serving to keep it firm on its plan; and that if columns without bases are now set aside, it is a mark of the wisdom of our architects, rather than an indication of their being governed by prejudice, as some adorers of antiquity would insinuate.'

169. Agreeably to these and such like arguments, enforced by the usage of Palladio and other modern architects of distinction, an attic base has been introduced to this order, but in our opinion the custom is a very needless one, and in bad taste. Why vary from the purity of the order, as practised by the people who best understood its character and form, and whose eye for proportion and effect has never been equalled? In the relics discovered at Athens by our illustrious countryman Stuart, we find the Doric column, always without a base, applied to edifices of the most unquestioned and consummate beauty. Are we mad enough to imagine that the Greeks merely overlooked this peculiarity? Can it be for a moment supposed that they who had taste sufficient to outvie all other people on the face of the earth, were unaccountably ignorant and barbarous in this individual instance? Besides, the character of the order, from its strength and severity, seems actually opposed to the introduction of the base, an addition harmonising well enough with the more delicate and exuberant beauty of the other two Grecian orders.

170. The shaft of the ancient examples was decorated with a number of channellings or flutings peculiar to itself. In the other orders an interval or fillet is introduced between each fluting, but here it is different. Hence has sprung the censure of Scamozzi, that this method of fluting is imperfect by reason of the projecting angles separating each flute, which renders the shaft tender and more liable to decay. The strength of this objection, however, will be greatly abated, when it is remembered that these

flutings are shallow, having their centre from the summit of an equilateral triangle, whose sides are equal to the width of the flute; consequently it is but little more than one-fourth of the depth of the other kinds of fluting, which are perfect semicircles. The Grecian temples, let us also bear in mind, were constructed either of marble or very hard stone, not subject to decay, and kept free from external violence with religious, nay, even superstitious caution; and without some degree of care, the angles even of the Ionic or Corinthian fluting will fall an easy prey to the injuries of outward violence.

171. The triglyph and mutule are other members essentially characteristic of the Doric order. The latter is considered as a memorial or imitation of the original hut, (see plate III, 2d. and 3d. examples, the beams of which are observed to project outwardly beneath the roof. The triglyph is supposed by some to be emblematical of the use of the firsttemple built according to this order, and dedicated to Apollo, to whose harp this ornament bears a kind of resemblance. The metope, or space between the triglyphs, has been enriched in many different ways. The ox's scull was employed for this purpose by Palladio, with a lighted torch suspended from each horn, and placed alternately with pateræ, expressive of the sacrificial offerings made to the heathen gods. There is a variety of other ornaments, however, which may be used with good effect either in public or private edifices. In the latter we may introduce with propriety crests and badges of dignity, heads, vases or pateræ, encircled with garlands of oak or laurel: in military structures, heads of Medusa, of Mars, or of the furies, are in good place. When this order is employed in churches and other religious buildings, the metope should be embellished with cherubs, doves, chalices, garlands of palm and olive, and other devices, emblematical of moral qualities; but the most elevated parts of all these should project little beyond the triglyph. This regulation was scrupulously adhered to by the ancients, who rarely gave their ornaments further projection than that of the borders in which they were enclosed. In conformity with this idea, the soffits of the corona (see plate IX.) have their ornaments within the thickness of the borders which receive them.

172. The following are the proportions of the principal parts of this order, see the specimen, plate III. The whole height of the entire order is divided into five equal parts, one of which is the height of the pedestal; and the remaining four, which are assigned to the column and entablature, are likewise to be divided into five. One of these belongs to the entablature, and the remaining four being divided into eight equal parts, one of them will be the inferior diameter of the column. Or we may express it thus:

173. The whole height of the order, including its pedestal, is twelve modules and a half, reckoning the module a whole diameter. The pedestal is two and a half; the base, shaft, and capital, eight; and the whole entablature two modules. Dividing the large diameter into sixty equal parts, called minutes; thirty are given to the base, thirty to the capital, thirty to the architrave, forty-five to the metope, and forty-five to the height of the cornice, including the upper fillet or capital of the triglyph. In this order, when the mutules are introduced in the entablature, as in the example referred to, fifty-seven minutes are assigned for the projection of the cornice. The projection of the mutules is equal to their width, being thirty minutes: the width of the triglyphs is exactly the same, and their distance from each other equal to the height of the metope, which by this division forms a perfect square. The sides of the channels of the triglyphs are at right angles with each other. The manner of dividing and drawing them, together with the conic drops, may be learned from plate IX. The soffit of the mutule, and that of the corona, are frequently ornamented; the former with conical drops, similar to those under the triglyphs, and the latter with roses in square lozenge compartments. (see plate IX.) The proportions of the smaller parts, and of the several mouldings which compose the whole, must in this, and every other order, be learned by reference to plates I. II. III.

Sect. IV.—The Ionic Order.

174. The Ionic Order is said to have been first used in the temple of Diana at Ephesus. This column is more slender and graceful than the Doric. Its ornaments are in a style of composition partaking at once of the plainness of the latter and the richness of the Corinthian. Its general effect is that of simple elegance.

175. The Ionic Order was employed by the ancients in the temples dedicated by them to Diana, Juno, Fortune, Concord, and deities of a similar nature. Le Clerc has ingeniously observed, that its style is particularly calculated for buildings dedicated to repose and tranquillity. The best examples of this order are to be found in the temples of Minerva Polias at Pryene; Ilyssus, at Athens; and among the Romans, in that of Fortuna Virilis, and in the theatre of Marcellus. The form of the Ionic profile seems to have been determined with greater precision than that of any other order.

176. The proportions of the principal parts of the Ionic column are as follow: the height of the entire order is divided into five equal parts. One of these parts is assigned to the height of the pedestal; and the remaining four are divided into five, for the column and entablature. One of these is appropriated to the entablature, and the remaining four are for the column, including its capital and base. These four being divided into equal parts, one is assigned for the inferior diameter. The cornice is fifty-four minutes in height, and its projection the same. The drip in the under side of the corona is channelled out one minute deep, and two minutes from the front; and before the cyma reversa, one minute.

177. The shaft of the column is sometimes fluted, and sometimes plain. Twenty, or twenty-four are the number of flutes allotted, not only to this, but to every other order. In general, however, twenty-four are preferable. The plan

of the flutes may be rather more than a semicircle, as they will then appear more distinct. The fillets, or intervals between them, must not be broader than one-third of the flutes, nor less than one-fourth; and it should further be observed, that in the capital of rich compositions, over each flute is placed an ove or egg. For the other particulars recourse must be had to plate I. In exterior works, when the building is large, the entablature may be enlarged to one-fourth of the whole column, without its pedestal, as was sometimes practised by the ancients. Palladio, however, makes no distinction of this nature; but allows only one-fifth part of the height of the column in all cases.

178. The volute is a principal member of the Ionic column, and presents a very different appearance in the Grecian and Roman specimens. In the latter, the small size of the volutes, coming down scarcely lower than the sculptured echinus (which is as high as the first spiral of the volute), occasions the omission of that beautiful hem which hangs so gracefully over the Greek original. The Grecian volute presents a double fillet, winding round to its eye, which, by the partings or spaces between, creates a various play of light and shade, and gives to the entire convolution additional beauty.

179. A singular example of this order, among the Romans, and in illustration of the heterogeneous and defective taste which too frequently obtained in their works, is met with in the temple of Concord; the cornice of which has mutules or modillions, like the Doric; dentiles like the Ionic; and three faciæ to the frieze, like the Corinthian—thus stealing from all its neighbours The capital has angular volutes, and an angular abacus, like the Corinthian, with a necking and row of leaves which we should find it difficult to refer to any order whatever. Both Grecian and Roman examples are square on the front, but present entirely a different aspect when viewed on their sides. (See the plan in plate I.). However greatly the eye of a pure taste may, in our opinion, prefer the Greek manner, as regards this beautiful order, it is but just to say, that the majority of modern architects seem to adopt a contrary notion, and to draw their models from the relics of Roman art.

180. The manner of drawing the volutes, according to Goldman's method, is as follows: (see plate IX.) Draw the perpendicular F A, termed the cathetus, and make its length equal to fifteen minutes. On the centre describe a circle, whose diameter is three minutes and a-half. Draw next a geometrical square, having its sides equal to the radius of the circle, as 1, 2, 3, 4. From the angles 2, 3, draw diagonals to the centre at C. Divide the side of the square 1, 4, into six equal parts, at 5, 9, 12, 8; and from these points draw parallel lines to the diagonals, as shown in the eye of the volute; whence will be obtained twelve centres, by which every arch composing the volute may be accurately drawn, each of them coinciding with the other. Thus, on the centre 1, fix one foot of the compass, and extend the other to F; and with this opening describe the arch F G. On the centre 2, with the other foot extended to G, describe the arch G H. On the centre 3, extending it to H, describe the arch H I; and, on the fourth centre, describe the arch I K, which completes one revolution. Proceed then in the same way to the centres 5, 6, 7, 8, for the second revolution; and to 9, 10, 11, 12, for the third revolution. Thus it appears that the whole convolution consists of twelve quadrants of circles, of so many different diameters.

181. To graduate the fillet, construct a triangle at O, of which the side F A is equal to that part of the cathetus contained from A to F; and the side V F equal to half the side of the square in the eye of the volute *a*, C, 1. Draw then the line S T, at a distance from V F, equal to the breadth of the fillet at F S, which may be two minutes, or one and seven-eighths. Take the space S T, and place it each way from the centre of the volute, as from C to 3. Divide S T into three equal parts, as at 1, 2, 3, in the eye of the volute, and from these points draw parallel lines to the diagonals, which will find twelve new centres; and proceeding from one to the other, as was done in drawing the exterior contour, the regular diminution of the fillet may be accurately performed.

Sect. V.—The Corinthian Order.

182. This order is evidently derivable from the architecture of Egypt, adapted, refined, and nationalized. Cecrops, the founder of Athens, was an Egyptian; and Dædalus, the earliest Athenian artist, visited the shores of the Nile to study the principles of the fine arts. Added to these facts, it is likewise well known that the Greeks borrowed their laws, manners, and customs, from the Egyptians, and purified them in the alembics of their own brighter genius.

183. The Egyptian origin of the Corinthian capital can scarcely be denied: their elements are incontestably the same; namely, a vase surrounded by flowers and covered with an abacus. (See Plate III.) The story handed down by Vitruvius, and related at sect. 65, was most probably the invention of a Grecian poet. M. Quatremere de Quincy, indeed, imagines that the Ionic also was taken from the Egyptians, and is merely a beautiful adaptation of their capitals of the head of Isis. The ears of the Egyptian capital he metamorphoses into the Grecian volute; the braids of hair on the forehead into the helixes or threads of the capital; the throat into the colarino, or necking, and so on. Following up this hypothesis, the Doric may also be said to have been drawn from the rude types or prefigurations of the Egyptians.

184. The Corinthian did not appear until long after the other two orders; and was employed in Corinth, its parent city, and other ancient states, in works requiring magnificence and delicacy, such as palaces, public squares, theatres, banqueting rooms, &c. The temples dedicated to female deities, and in some instances those of Jupiter, Mercury, and Mars, were also built of this order. The Roman examples of the Corinthian order do not differ from the Grecian in anything like a corresponding degree with the others: indeed, the most perfect examples may probably be found among the ruins of the eternal city.

We doubt, for instance, whether any other specimen can rival, for tasteful richness and exquisite proportions, the three columns in the Campo Vaccino at Rome, supposed to be the remains of the temple of Jupiter Stator.

185. The ancients were in the practice of introducing into the frieze representations of various figures. (See plate 11). A full display of these may be found in Stuart's Antiquities of Athens. When the entablature is thus enriched, the shafts must be invariably fluted; and the flutings may be filled with cablings, one third from the bottom of the whole height of the shaft, as in the interior of the Pantheon. The base of the column may be either Attic or Corinthian. The olive-leaf is frequently substituted, in the Roman examples, for the acanthus, which is more peculiarly applied to the Composite order.

186. The following are the general proportions of this order: the whole height of the entire order is divided into five equal parts, and one is given for the height of the pedestal. The remaining four are divided into five equal parts; one is assigned for the entablature, and the remaining four are assigned to the height of the column, including its base and capital; which are again divided into ten equal parts, one of which is for the inferior diameter. The base is thirty minutes, and the capital seventy in height. The cornice is sixty minutes in height, and fifty-eight in projection.

187. The soffit of the corona is worked in square compartments, as in the Composite; but the soffit of the modillion (see plate 5) is ornamented with an olive or acanthus leaf, the same as in the capital. The breadth of the modillion (see plate V.) is ten minutes and a half; and the space between each modillion twice their width. The abacus of the capital is sometimes plain, and sometimes fluted. In some capitals the volutes rise higher than the under side of the abacus, but the capital looks best when they are bounded by its under surface.

188. To determine the plan of a capital according to the ancients, draw a geometrical square whose sides are one diameter and a half. To this square draw diagonals; and on these place from the centre, or their intersection, a space equal to one diameter, through which point lines being drawn at right angles with the diagonals will determine both the projection and thickness of the volutes. For the curvature of the abacus, extend the compasses from one angle to the other of the side of the abacus; and with this opening intersect two arches described from the angles of each horn of the abacus; and the point of intersection will be the centre, by which, with the same opening of the compasses, the concavity of the abacus will be accurately drawn. See the plan in plate II.

Sect. VI. The Tuscan Order.

189. Of the Tuscan Order little historical can be said; neither is there any regular example of among the remnants of antiquity. Piranesi has given a drawing of a Tuscan base found at Rome, but of what date is uncertain. Vitruvius has stated the general proportions, but not in a very distinct manner, and does not refer to a single example. It is the most solid and simple of all the orders, and on that account is often treated of first; an arrangement which has not been adopted in this work, because we regard the Tuscan order more as a derivative from the Doric than as an original invention. The Trajan and Antonine columns at Rome have been reckoned of the Tuscan order, though their height is eight diameters, and the torus and capitals are certainly more ornate than is consistent with Tuscan plainness. The fluting to the necks, likewise, are according to the most ancient Doric examples.

190. The Doric, divested of a few mouldings, its triglyphs, and a diameter or two of height, will answer every purpose for which the Tuscan can be required. The purest specimen of the latter in England, perhaps in the world, is the church of St. Paul, Covent-Garden, which has been by some lauded as a prodigy of art, and by others designated as a mere ornamented barn. This order, with its huge projection of the crown members over the long cantalivers, may be applied with the greatest propriety to market-places, stables, and such-like structures.

191. The proportion of the Tuscan column, (with its pedestal and entablature,) is as follows: Divide the whole height of the entire column into five equal parts, one of which is for the height of the pedestal; and the remaining four are assigned for the base, shaft, capital, and entablature, which being again divided into five equal parts, one is given for the entablature, and the remaining four being divided into seven equal parts, one is for the inferior diameter of the shaft. In massy buildings a more heavy entablature may be used, as was customary amongst the ancients. They divided the whole height assigned to the base, shaft, capital, and entablature, into four equal parts, and gave one to the entablature. The profiles of Vignola and Palladio have this proportion.

192. Take half of the inferior diameter, for the height of the base, including the plinth; and the same for the height of the capital, exclusive of the astragal. Take the inferior diameter, and divide it into sixty equal parts, which are called minutes. A module is considered by some to be only half a diameter; but others extend it to a whole one, which has been adopted as the most simple and entire. Palladio uses the whole diameter in every order except the Doric. Vitruvius also employs the large module, reckoning the proportion of the column by the lower or inferior diameter of the shaft; and we do not see that either the semi-diameter, or the twenty minutes contrived by some, will more nearly answer to the different parts of the column.

Sect. VII.—The Composite Order.

193. This order is obviously derived from the Ionic and Corinthian, but it cannot, we think, in any case, be applied with superior effect to the latter. It was first employed by the Romans in the triumphal arches erected by them to exhibit to posterity their dominion over their conquered provinces.

194. The Composite unquestionably derives its origin from that constant solicitude after novelty which always renders the mind of man restless in enlightened and highly cultivated ages. The desire of variety and novelty, stretched to a

point beyond the judicious, engaged the Roman architects to combine with the proportions and enrichments of the Corinthian order the angular volute of the Ionic, and thus to compose a new order.

195. We have placed the Composite order last of the five, on account of its more recent invention and compound nature. On the same principle we have placed the Doric first, as its priority both of character and employment demanded. At the same time, it is proper to observe that, in instances where order upon order is introduced, as in some extensive and magnificent structures, we see first the Tuscan, then the Doric, next the Ionic, fourthly the Composite, and lastly the Corinthian. We will also give Sir William Chambers's remark on the subject: 'Most authors give the last place to the Composite order, as being the last invented, and a compound; which of course ought to be preceded by all the simples. I have followed Scamozzi's method, his arrangement appearing to me the most natural: for his orders succeed each other according to their degrees of strength; and in the progression that must absolutely be observed, whenever they are employed together.'

196. There are numerous examples of the Composite order remaining at Rome. Probably the best is that of the arch of Titus, fine casts from every part of which have been introduced into this country by Mr. Joseph Gwilt.

197. The following are the general proportions of this order: the height of the entire order is divided into five equal parts, one of which is appropriated for the height of the pedestal, and the remaining four for the column and entablature. These four parts being again divided into five, one is for the entablature, and the remaining four for the height of the column, including its base and capital. The height of the column is divided into ten equal parts, one of which is given to the inferior diameter. The base is thirty minutes, the capital seventy, in height, adorned with acanthus leaves, and volutes, drawn by the same method as those of the Ionic: and the plan of the capital is similar to that of the Corinthian order. (See plate II. and sect. 188.)

198. The soffit of the corona is divided into square compartments, cut out of the solid, decorated with roses, whose relief must not project more than the borders which enclose them. In rich compositions the soffits of the modillions are also ornamented; but their relief is not to exceed the horizontal surface, which would greatly injure the effect of the modillion, and render the appearance of the profile of the entablature less pleasing.

Sect. VIII.—Of the Orders of Sacred Buildings, or Temples of the Greeks.

199. These are seven: 1. the Antis; 2. the Prostyle; 3. the Amphiprostyle; 4. the Peripteral; 5. the Dipteral; 6. the Pseudo-Dipteral; and 7. the Hypæthral.

1. The order of temples called Antis is that wherein the end of the wall finishes in pilasters, or antæ, and has two columns between them; such is Inigo Jones's fine Tuscan portico of St. Paul's church, Covent-garden.

2. The second order, called Prostyle, differs from the Antis by having columns added opposite the pilasters, or antæ, of each corner. The foregoing two orders have only porticoes at one end.

3. The Amphiprostyle is the same as the Prostyle; but, as its name imports, with a posticum, or rear front, the same as the principal front.

4. The Peripteral has also porticoes at both ends, of six columns each, and eleven, counting the angle columns, at each side. It has, as its name shows, columns all round about the cell, as in the temple of Theseus, which, by the way, has two more columns in flank than the rules of Vitruvius prescribe.

5. The Dipteral, which Vitruvius places after the Pseudo-Dipteral, is octastyle, or eight-columned, like the portico of the Parthenon, but has a double row of columns all round the cell.

6. In the Pseudo-Dipteral, or false dipteral, the porticoes are octastyle, or eight-columned, in front, and on each side fifteen columns, counting those at the angles. The Parthenon is of this order of temples, but has seventeen columns on the sides; for the ancient architects of Greece did not servilely follow every dogmatical rule of the critics, yet in their variations they never lost the true spirit of the original.

7. The Hypæthral order of temples is decastyle, or ten-columned, both in front and rear; the other parts are distributed the same as the dipteral, but it has in its interior a double row of columns, one higher than the other, continued on all sides, and resembling an interior porch, and is called, from its situation, a peristyle. The middle part has no roof. A fine example of this order of temples is to be found in that of Jupiter Olympus at Athens. In Rome there is no example of it.

200. There are also circular temples, not classing under either of these orders; some of which are called Monopteral, having one row of columns round about them, and no cell. Others are called Peripteral, having a cell, round which the columns are arranged, standing on a continued pedestal called a stylobate, like the temple of the Sybil at Tivoli, the choragic monument of Lysicrates at Athens, and the temple of Vesta at Rome.

Sect. IX.—Of the Intercolumniation of the Orders.

201. Intercolumniation is the manner of distributing the columns according to regulations founded on good taste, reason, beauty, and strength.

202. Columns are either engaged or insulated; and, when insulated or detached from the wall, they are either very near, or at a considerable distance from it. When they are placed at a considerable distance from the wall, they are destined to support the entablature; and their distance from each other should be consistent both with their real and apparent solidity. Engaged columns are attached to the wall, and are not limited in their intercolumniations, as they depend on the breadth of the arches, doors,

windows, niches, or other decorations placed in them.

203. The ancients used five different species of intercolumniations, which, according to Vitruvius and Palladio, are as follows:

1. The pycnostyle, of which the interval or space is one and a half of the inferior diameter of the columns. Of this style are the Parthenon and temple of Theseus.

2. The systyle, whose interval is two diameters.

3. The eustyle, two diameters and a quarter.

4. The diastyle, three diameters; and

5. The aræostyle, four diameters.

204. The three first of these were used by the Grecians, in the Doric, Ionic, and Corinthian orders; but the distances of the triglyphs of the Doric determined the intercolumniations of that order, as we shall by and by describe.

205. The ancient Romans preferred the eustyle in most cases, as the best medium of the too little and too great intervals of column; but in their Tuscan works they used a space equal to four, and sometimes six diameters, which intercolumniation was admissible in this order, since the architrave was usually formed of some kind of timber, when the other parts of the entablature were of stone. Palladio says, this intercolumniation of the Tuscan order was adapted to farm houses and other rustic works, as it afforded a passage for carts, and was attended with the least expense. In structures built entirely of stone, however, they used a shorter interval, more suitable to the length of their marble blocks, and more agreeable to the ponderous fabric which they occasionally supported; for which reason the diastyle and eustyle modes were sometimes applied to this order. The moderns have, indeed, adopted these two as their general rule, and apply them to every order except the Doric. The aræostyle, however, is sometimes, by a modern contrivance, authorised by a few examples of the ancients, introduced in porticoes and peristyles. This mode of the aræostyle is from Perrault, and is managed by placing two columns together at the angles, so close as to admit the two capitals nearly into contact. This manner, which is termed grouping, takes off from the excessive width of this kind of interval, whilst it adds to it both real and apparent strength, as is exemplified in St. Paul's cathedral in London, and in the palace of the Louvre at Paris.

206. The intercolumniation of the Doric order is often attended with peculiar difficulty, arising from the strict regard that is ever paid to the true width of the triglyph, and the perfectly square form of the metopes, or their intervals. Besides, it is considered requisite that a triglyph should be placed exactly over the centre of every column. For these reasons the mutules and triglyphs have been omitted in some capital works, both ancient and modern, as in the Colosseum at Rome, and the Royal Hospital at Greenwich.

207. When the capitals and bases of coupled Doric columns have their proper projections, and are at any distance from each other, the metope between them will be rather too wide; but that may be avoided by confining the projections, or making the triglyph one minute more than it really should be, and placing or removing its centre a minute within the axis of the column, which trifling differences will not be perceived without the nicest examination.

208. In small buildings, such as temples and other similar ornaments for gardens, the intercolumniations may be determined, without paying a strict regard to the general rules for the distances of columns; always observing, however, that such works must have an interval that will admit of an easy passage between them.

Sect. X.—Of Arches and their Ornaments.

209. Arches are not so magnificent as colonnades; but are more solid and less expensive. They are proper for triumphal entrances, gates of cities, of palaces, gardens, or parks; and, in general, for all openings that require extraordinary breadth. There are various manners of adorning arches. Sometimes their piers are rusticated; sometimes they are adorned with pilasters, termini, or caryatides; and sometimes they are made sufficiently broad to admit of niches or windows.

210. The circular part of the arches is either surrounded with rustic key-stones, or with an archivolt enriched with mouldings; which, in the middle, is sometimes interrupted by a console, or mask, (See plate IX.) serving at the same time as a key to the arch, and as a support to the architrave of the order. The archivolt is sometimes supported by an impost at the head of the pier; and at others by columns placed on each side of it, with a regular entablature, or architrave and cornice.

211. There are likewise instances of arcades without piers, the arches being turned on single columns, as in the temple of Faunus at Rome, &c. But this practice ought not to be imitated, as it is neither solid nor handsome. When arcades, however, are employed to ornament domestic apartments, the breadth of the pier need not exceed a quarter of the opening of the arch.

212. When arches are closed up, to receive doors, windows, or niches, the recess should be sufficient to contain all the projections of what is placed therein, otherwise their appearance is clumsy, and will become too principal, which produces a bad effect in the composition. When arches are large the key stone should never be omitted, but cut in the form of a console, and carried close under the soffit of the architrave, which, on account of its extraordinary length, requires a support in the middle. The imposts of arches should never be omitted; at least, if they be, a platform ought to support their place. If columns are employed without pedestals in arcades, they should always be raised on a plinth.

213. In arches of great magnitude the circular part ought not to spring immediately from the impost, but take its rise at such a distance above it as is necessary in order to have the whole curve seen at the proper point of view. The void or aperture of arches should never be higher, nor much lower, than double their breadth; the breadth of the pier should never exceed two thirds, nor be less than one-third of the breadth of the arch; and the angular pier ought to be

broader than the others, by one-half, one-third, or one-fourth; the impost should not be more than one-seventh, nor less than one-ninth of the aperture; and the archivolt must not be more than one-eighth nor less than one-tenth of it. The breadth of the console must, at the bottom, be equal to that of the archivolt; and its sides must be drawn from the centre of the arch; the length of it should not be less than one and a half of its smallest breadth, nor more than double. The thickness of the pier depends on the breadth of the portico; for it must be strong enough to resist the pressure of its vault. But with regard to the beauty of the building, it should not be less than one quarter of the breadth of the arch, nor more than one-third. Such are the general dimensions of arches.

214. The proportions peculiar to the Tuscan arch, of which we have given an example, without pedestals, are as follow: In height their aperture is seven diameters and a quarter; in width four, and from centre to centre of the columns, six diameters. According to the preceding remarks, the archivolt and imposts are half a diameter; and from the top of the archivolt to the underside of the architrave should not be less than fifteen minutes. The breadth of the key-stone at the bottom is equal to its archivolt; and its spreading sides are determined by lines drawn from the centre of the arch, as is shown in plate VII. The plinth is one diameter in height, and the proportions of the column and entablature do not differ from the order. For the proportions of the mouldings of the archivolt and imposts, see plates I. & VII.

215. The Tuscan arch with pedestals is in width four and a half, and in height eight diameters and a quarter; and from centre to centre of each pier is six and three quarters. In every other particular they are subject to the preceding rules.

216. Doric arches, without pedestals, (see plate VII.) are seven diameters and three-fourths high, and in width four diameters and fifteen minutes. The piers are two modules in front, and in thickness one module, twenty-two minutes and a half; or in proportion to their distance from the wall. From centre to centre of each pier is six diameters and fifteen minutes. Arches of this order, with pedestals, have their apertures, in height, nine diameters and thirty minutes; and in their width, five diameters, fifteen minutes. The piers are two diameters, fifteen minutes wide in front; and from centre to centre of each is seven diameters and fifteen minutes.

217. As to the arches peculiar to the other orders, all that is necessary, after what has been remarked on the two preceding ones, is a careful inspection of plate VII. where the several proportions appear.

Sect. XI.—Of Pilasters and their Uses.

218. Pilasters differ from columns only in their plan; which is a square, as that of columns is round. Their bases, capitals, and entablatures, have the same parts, with the same heights and projections, as those of columns; they are also distinguished in the same manner, by the names of Doric, Ionic, Corinthian, Tuscan, and Composite.

219. The column is undoubtedly more perfect than the pilaster. However, the latter may be employed with propriety on many occasions. Some authors object to pilasters, conceiving that they do not admit of diminution. But this is a mistake; there are many instances, in the remains of antiquity, of their being diminished. Scamozzi always gave his pilasters the same diminution as his columns: Palladio and Inigo Jones have likewise diminished them in many of their buildings.

220. Pilasters are employed in churches, galleries, halls, and other interior decorations, to save room; as they seldom project beyond the solid wall above one quarter of their diameter. They are likewise used in exterior decorations; sometimes alone, instead of columns, on account of their being less expensive; and sometimes they accompany columns, being placed behind them to support the architraves, where they enter the building, as in the Pantheon at Rome; or, in the same line with them, to fortify the angles, as in the Portico of Septimius Severus.

221. Pilasters should project one quarter of their diameter beyond the walls, when used alone. When placed behind columns, especially if they be very near them, they need not project above one-eighth of their diameter. But, when placed on a line with columns, their projection must be regulated by that of the columns; and, consequently, it can never be less than a semi-diameter, even when the columns are engaged as much as possible.

222. The shafts of pilasters are frequently adorned with flutings in the same manner as those of columns; the plan of which may be a trifle more than a semicircle: their number must be seven on each face, which makes them nearly of the same size with those of columns. Their intervals, or fillets, must either be one-third or one-fourth of the fluting in breadth. The capitals of pilasters are profiled nearly in the same manner as those of columns.

Sect. XII.—Of Attics.

223. Attics very properly follow the pilasters; being nothing more than square pillars with their cornices. They had their origin in Athens, where it was for many ages a rule in building to conceal the roof. For this purpose nothing served so well as a kind of low or little order ranged in a continued line, singly, or with the interruption of balusters; which, rising above the rest of the work and before the roof, hid it perfectly, and substituted something more agreeable to the eye. The place of attics, therefore, is at the uppermost extremity of a building, to which they serve as a crown, or very properly make a finishing for the other orders when they have been used in the structure. They must never stand under any thing except such ornaments as are placed at the very top.

224. Attics should never exceed in height one-third of the height of the order on which they are placed, nor be less than one quarter of it. The base, dye, and cornice, of which they are composed, may bear the same proportions to each other as those of pedestals do; and the base and cornice may be composed of the same mouldings as those pedestals. Sometimes the attic is

continued throughout; at others it projects, and forms a pilaster over each column of the order. The breadth of this pilaster is seldom made narrower than the upper diameter of the column below it, and never broader. Its projection may be equal to one quarter of its breadth.

Sect. XIII.—Of Orders upon Orders and of Basements.

225. Having already alluded to the succession of orders generally observed, from the ground upwards; (see sect. 195.) we have now only to remark, that in placing columns upon one another, the axis of every column should be perpendicular to that of the other; at least they must be so in the front view. With regard to the proportions of columns placed above each other, Scamozzi's rule, 'that the lower diameter of the superior column ought constantly to be equal to the upper diameter of the inferior,' is universally esteemed the best, and gives all the columns the appearance of one long tapering tree cut into so many pieces.

226. We have few examples, however, in this country, of more than two stories of columns in the same elevation; for when there are three it is difficult to avoid some striking inconsistencies, or to preserve the character of each order in its intercolumnial decorations; since the intervals of the upper columns must become too wide, and would neither appear graceful nor solid. Indeed, in our own opinion, the system of heaping order upon order is altogether in bad and mistaken taste. Its effect is sometimes striking, but will not bear scrutiny. Independent of the difficulty mentioned above, the elementary and essential object and nature of a row of columns is wholly falsified thereby.

227. Instead of thus employing several orders, one above another, the ground floor is, in some cases, made in the form of a basement, on which the order that decorates the principal story is placed. The proportions of these basements are not fixed, but depend on the nature of the rooms on the ground floor. In some structures the height of the basement is equal to that of the first order. In others it does not exceed two-thirds of the order; and in others again is only half its height. Basements should never be higher than the columns they support, nor less than one half of their height.

228. Basements are usually decorated with rustics, whose height, including the joint, should be half a diameter of the order placed upon them. Their figures are from a square to a sesquialtera; and their joints may be either square or chamfered. The square joint is one-eighth of the height of the rustic, and in depth they are equal to their width; those that are chamfered should form a rectangle; and their joints are one-fourth of the width of the flat part of the rustic.

PART III.

GENERAL PRINCIPLES OF THE ART.

Sect. I.—Of Composition and Harmony in Building.

229. The original intention of architecture being, as we have seen, protection against the inclemency of the elements, its first attempts were obviously limited to the accomplishment of that object. The penetration of wind and rain, however, into the recesses of these rough structures would gradually instil the principles of order, solidity, and general proportion; and the internal beauty and agreeableness of these properties being discovered, the inventive faculty of man was calculated to proceed, step by step, until harmony, regularity, and grandeur, were superadded to convenience and utility.

230. It is one of the great rules of our art, that every building should be adapted in appearance and style to the purpose for which it is erected. In this spirit we may distinguish them into three principal classes: namely, 1. Such as are intended solely for utility; 2. Such as are designed altogether for ornament; 3. Such as are meant to comprehend both.

231. Buildings intended solely for utility ought in every part to correspond with that design. Any material deviation from usefulness for the sake of ornament should be strictly avoided. Works of simple usefulness are considered as a mean to some end; and, the nearer they approach to a perfect mean for obtaining that end, the more will such structures gain our applause, though every beauty of ornament be neglected. On the other hand, in works merely calculated for ornament, such as columns, obelisks, triumphal arches, &c. beauty alone ought to be regarded. The principal difficulty in architecture lies in combining usefulness and ornament. The most practicable method is to prefer the former to the latter, in proportion as the character of the building requires it. In palaces and large buildings which admit of a variety of useful contrivance, regularity and display ought to be preferred; but in dwelling-houses that are on too small a scale for variety, regularity should give place to usefulness, so far at least as the former is inconsistent with the latter.

232. In considering attentively the beauty of visible objects, we discover two kinds. The first may be termed *intrinsic* beauty, because it is discovered in a single object, without relation to another. The second may be termed *relative* beauty, being founded on a combination of relative objects. Architecture admits of both kinds.

233. The appearance of a palace ought to convey an idea of the majesty and grandeur of the monarch: and a like conformity should appear in temples, as well as in those inferior structures erected by art for the accommodation of the various classes of human society. In all cases regard is to be paid to the dignity, rank, and profession of the occupier, rather than to his wealth. The former circumstances are open and obvious, the latter not so.

234. If a building is destined for some particular purpose of a public nature, we should regard that purpose alone. A play-house should have a gay and splendid style, but that of a church should be not only grave and solemn, but also bold and magnificent, affording a proper quantity and equal distribution of light to every part occupied in the time of worship. The ap-

pearance and style of a monument ought to be solemn and gloomy, so ornamented as to awaken the memory of the deceased in the minds of surviving friends. Courts of justice, senate-houses, &c. have, in like manner, and on the same principles, their proper styles, which will always be observed by a good architect.

235. Nothing can be more evident, than that the form of a dwelling-house ought to be suited to the climate; yet no error is more common than to copy in Britain the form of Italian houses, not forgetting even those parts that are purposely contrived for collecting air, and for excluding the sun; witness our colonnades and logios, designed by the Italians to gather cool air, and exclude the beams of the sun, conveniences which the climate of this country does not require.

Sect. II.—Of the Beauty arising from Proportion.

236. The proportions of a door are determined by the use to which it is destined. The door of a dwelling-house, which ought to correspond to the human size, is confined to seven or eight feet in height, and three or four in breadth. The proportions assigned to a stable or coach-house are different. The door of a church ought to be wide, to afford an easy passage to a multitude; and its height should therefore be in proportion, that its appearance may please the eye. The size of windows ought always to be in proportion to the dimensions of the room they are intended to illuminate; for if the apertures, or openings, be not large enough to convey light in an equal distribution to every part of the room, the whole will have a deformed appearance. Nothing can be more disagreeable than to see a profusion and glare of light in one part of a room whilst the other is under a strong shade; such contrary effects always prove disadvantageous to the appearance of furniture and other ornaments common to handsome apartments. Steps of stairs should likewise receive a suitable proportion, and be accommodated to the human figure, without relation to the magnitude of any other part of the building; and therefore in small and large houses they are alike in height, because men are nearly alike in stature.

237. The proportion of rooms may be either intrinsic or relative, though in most cases both are included. The intrinsic proportion of a room is its length, breadth and height; which being harmoniously adjusted, we pronounce it of a beautiful proportion, without regard to any other part of the building. But the relative beauty of proportion is, as the whole area of the room is to the magnitude of the house of which it composes a part. A room may be well-proportioned as to itself, but may, at the same time, be either too large or too small for the whole edifice. In a sumptuous building the capital rooms ought to be large, otherwise they will not be proportioned to the size of the whole; and for the same reason a very large room is improper in a small house; yet every house ought to have both large and small rooms, in proportion to itself. But in things thus related, the mind requires not a precise or single proportion, rejecting all others; on the contrary, different proportions are sometimes equally agreeable to contemplate. It is only when a proportion becomes vague and distant, that the agreeableness abates and at last vanishes.

238. With regard to the proportion the height of a room should bear to the length and breadth, it must be rather uncertain in some cases, arising from that deception to which the eye is subject, when its height exceeds sixteen or seventeen feet; yet if a proper optical allowance be made, we do not think the attainment of a beautiful proportion so hazardous or arbitrary a task as some architects would insinuate. A room forty-eight feet in length, and twenty-four in breadth and height, is well proportioned; but, it is well known, that were we to reduce those to twenty-four and twelve, a room would approach too near the appearance of a gallery. Yet it is evident, that, if the proportion be so adjusted as to be in the medium between these two, a room cannot produce a bad effect as to its size. For instance, if the height and breadth be eighteen feet each, and the length thirty-six feet, this proportion of a room is by architects termed harmonic, or agreeable to the eye, answering to *diapente*, one of the chords in music, which includes the interval from one to five, and is agreeable to the ear.

239. Upon this principle there are seven proportions assigned to rooms, termed harmonics or agreeables. The cube, cube and half, double cube, the subduple of 4, 3, and 2—ditto of 5, 4, and 3—ditto of 6, 4, and 3—and lastly of 3, 2, and 1. Upon this scale, if the height of the room be eighteen feet, as before, it is of the cube form when the floor, ceiling, and side-walls, are all of one dimension. The second, or cube and half proportion, will be twenty-seven feet long, and eighteen broad; the third, or double cube proportion, thirty-six feet by eighteen broad; the subduple of 4, 3, and 2, produces thirty-six feet in length, and twenty-seven in breadth; ditto of 5, 4, and 3, produces thirty feet by twenty-four broad; ditto of 6, 4, 3, produces thirty-six by twenty-four broad; ditto of 3, 2, and 1, produces fifty-four by thirty-six broad.

240. To find the produce of these subduples proceed thus:—in every case divide the given height of the room by the smallest numbers, 3, 2, or 1, as may be required. Again, multiply the quotient by the middle numbers 4, 3, or 2, and the produce will be the width of the room. Lastly, multiply the said quotient by the largest numbers 4, 5, 6, or 3, and the produce will give the length of the room of the first sub-duplicate, 4, 3, and 2.

Example.

Divisor.	Dividend.	Quotient.
2)	18 (	9

3 middle number multiplied quotient 9 mult. by —
the large number 4 — 27 ft. width of the room.

36 ft. length of the room.

241. If we propose twelve feet for the height of a room, proceed as above. Yet it should be observed, that the double cube proportion of a

:.om upon this scale would be twelve feet in height and width, and twenty-four in length, which, though admitted by a certain architect amongst the number of the harmonic proportions for rooms, yet it is condemned by him as approaching to the form of a gallery; which is certainly a self-contradiction, and tends to unsettle and render undeterminate the very doctrine he advances. On the other hand, the cube form, though admitted into the number of harmonic proportions, would as often be pronounced by the judgment of sight too broad. This however is to be understood only when a room is of large dimensions; for, when small, it is quite agreeable and convenient.

242. It is evident, then, that the double and single cube are two extreme proportions for rooms, and that each of them requires a certain scale of magnitude to render them beautiful and useful; the former being applicable to a large room, the latter to a small one. It is also evident that the doctrine of harmonic proportions of rooms is not perfect, otherwise there could be no exceptions taken in any case. It is not so in the proportion of sounds; every chord is alike pleasing upon any scale; and though some of the chords are less complete than others, yet all of them produce harmony to every ear capable of the sweet sensation of music. We therefore conclude, that though there exists some agreement between the doctrine of sounds and the dimensions of a room, yet they are not analogous; consequently the judicious architect will make his own exceptions. There is indeed no strict resemblance between the objects of different senses.

243. *Figure of Rooms.*—It is clear that rooms, consisting of four sides, with right angles, are the best fitted for the reception of light and the distribution of furniture: but when the light is admitted by an aperture in the ceiling, the circular or polygonal form is to be preferred.

Sect. III.—Of the External Proportions of Houses.

244. It has been remarked, that to see, on a considerable eminence, the length of a front trifling, and the height disproportioned, would be as absurd as to behold a front in a valley long and extended, and elevated only one story. Proportion requires our nicest choice, which must be dependent upon rules; for, as the jarring of instruments by blind chance cannot possibly please the ear, so the disproportion of the parts of any object must naturally shock the eye; and, in both, unerring rules must so proportion the sounds, and dispose the parts, as that the whole may be in complete harmony. Nature has taught mankind, in music, certain rules for proportion of sounds; so architecture has its rules dependent on those proportions, or at least such proportions as are in arithmetical harmony; and those we take to be dependent on nature. The square in geometry, the unison or circle in music, and the cube in building, have all an inseparable proportion, the parts being equal, and the sides and angles, &c. give the eye and ear harmonic pleasure.

245. This theory, however, when applied to the whole fabric, admits of exceptions; for the cube must not exceed fifty feet; the cube-and-half sixty feet, and the double cube eighty feet front. The general rule is, that if the cube be fifty feet front, the depth and height will be the same. The cube-and-half is when the front is sixty feet long; the depth and height each forty feet. The double cube of sixty feet will be thirty feet deep and thirty feet high. In the country, where gentlemen's houses are detached, and are easily viewed in front and depth by an approaching traveller, a strict regard to proportion becomes necessary; for, if the cube form be adopted in very large houses, it will appear uncouth and heavy; while, on the other hand, it is equally disagreeable to see a dwelling-house assume the appearance of a lofty tower.

246. Very high dwelling-houses are exceedingly inconvenient; and, therefore, where beauty of proportion is joined to utility, they ought rather to assume the figure of a parallelopipedon resting on its larger base. Hence that form of building which rather spreads upon the ground than rises in height, is always preferable. In towns the houses, being generally attached to each other, compose together regular streets or squares: in which case the proportions of an individual front are less obvious, and the depth in this respect immaterial. The great object is the uniformity of the whole, when completed; or of one individual house with the whole. In such situations, the proportions of the houses, and the length and extent of streets, are generally subject to other than to architectural laws.

Sect. IV.—Of the Situation and Internal Division of Houses.

247. A proper situation for building, where a choice can be had, is highly worthy the attention of an architect. It must be obvious, that a rising ground is much better suited for a magnificent mansion than a concealed valley; and that it would be incongruous and absurd to erect a sumptuous building on a wild, uncultivated, and barren ground, destitute of water, wood, hills, or other pastoral beauties which nature has assigned to various portions of the earth. Where such situations are left to the choice of the architect, it becomes him to apply his taste in fixing the precise site and bearings of his intended work, in the execution of which he must attend to the four cardinal points.

248. In the first place, he must see that every internal division, or room, receives a due degree of light and heat, suited to its intended use and the different seasons in which it is more particularly to be occupied. Here the skilful architect must exercise several of those qualifications enumerated by Vitruvius as essentially requisite to the formation of his character. Indeed, the qualifications which are absolutely necessary in the proper choice of the situation and plan of a town or city, are precisely those which are wanted to complete a country residence.

249. The chief objects of human concern being health, pleasure, and convenience, whatever contributes to these must be studied with attention. Hence, the necessity of a situation best adapted for good air, a sufficient supply of whole-

some water at a convenient distance for family uses, and fertile grounds, whose produce in summer may render salubrious the element in which we breathe. For the same reasons, marshy, low, and barren lands, and more especially stagnant waters, should be avoided.

250. One infallible mark of a good situation for health, is thriving cattle and healthy inhabitants. In fixing on the precise spot of ground, that which is moderately elevated, if it be contiguous to some river, will be the best. In such a situation, the air has a constant motion and free circulation, by which it purifies itself as water does by a current, and becomes more salutary to the human frame. And nothing can so much contribute to the excellence of a prospect as a river, especially a winding one; the beauty of which will, in idea, be heightened by its utility as the means of supplying water.

251. These essential preliminaries being settled, the architect proceeds to consider in what direction his front and flank are to be placed, with respect to the south and north points. This, in many instances, will be closely connected with the internal division of the house. Cool drawing-rooms are suitable for summer; and for this purpose they should be large, and situated toward the north, so as to be screened from the scorching beams of the sun. Warm drawing-rooms are adapted for winter; and, therefore, these should be smaller, and have a place towards the south, or where the rays of the sun have free entrance. Rooms appropriate to spring and autumn may be in a medium situation to these, and should have their windows to look into the different gardens or green walks. Libraries, studies, and morning rooms, should have the same sort of prospect, as being most suitable for morning exercises. If the house be built on so large and magnificent a scale as to admit a similar variety in all the different apartments, the dining-parlours, bed-rooms, &c. will be subject to the same laws of situation, and answer to the different seasons of the year.

252. It has been doubted whether the principal rooms should lie nearest the grand entrance, as being best suited to give them their full effect. The following reasons have been urged against this:—To provide a large and spacious room for the immediate reception of the visitor is a bad contrivance in several respects. 1. When, from the open air, we step into such a room, its size is apparently dimished by contrast; and it looks little compared with the great canopy of the sky. 2. When it recovers its grandeur, as it soon does, it gives a diminutive appearance to the rest of the house; passing from it, every apartment looks little. 3. By its situation, it serves only for a waiting-room, and a passage to the principal apartments.—Rejecting therefore this form, a hint may be taken from the *climax* in writing, for another that appears more suitable.

253. The different offices should be so arranged, as to compose an inferior portion of the whole building, not totally detached, yet in such order as to keep the more offensive ones as remote as possible from the principal parts of the house. This, indeed, is in conformity with the arrangements of nature.

Sect. V.—Of the various Ornaments which contribute to give a peculiar Expression, or an apparent Usefulness, to Buildings.

254. Some writers on architecture have doubted whether a building can admit of any ornaments but such as are useful, or at least have the appearance of being so. But, considering architecture no less as a fine than a useful art, both species may be properly introduced. A private house, it is true, and other edifices where use is the chief aim, do not admit of any ornaments but such as have the appearance of utility. But temples, triumphal arches, and other buildings chiefly intended for show, may be highly ornamented without any loss of their apparent usefulness. Hence, a threefold division of ornaments has been suggested, viz.

255. 1st. Ornaments that are beautiful without relation to use; such as statues, vases, &c. 2d. Objects in themselves not beautiful, but possessing the beauty of utility, by imposing on the spectator, and appearing to be useful; such as blind windows. 3d. Where things are beautiful in themselves, and at the same time assume the appearance of use; such as pilasters. With regard to the first, a statue should be so placed, that it may be seen in every direction, and at various distances, either in receding or advancing. Statues ought not to be placed in the niches or fronts of houses, or on the tops of walls and roofs. Their proper places are in large halls, and in passages that lead to a grand stair-case, &c. To adorn the top of the wall with vases is an absurd conceit, by placing a thing, whose natural destination is utility, where it cannot have even the least appearance of it. Firmness and solidity being the proper expressions of a pedestal, as lightness and delicacy are of carved work, the pedestal, whether of a column or of a statue, ought to be sparingly ornamented. The ancients never ventured on any bolder ornament than the basso relievo.

256. As for ornaments of the second kind, it is a great error to contrive them so as to make them appear useless. A blind window, therefore, when necessary for regularity, ought to be so disguised as to appear a real window: when it appears without disguise, it seems a vain attempt to supply the want of invention; it shows the irregularity in a stronger light, by signifying that a window ought to be there in point of regularity, but that the architect had not skill sufficient to connect external regularity with internal convenience.

257. With regard to the third species of ornaments, it is an error to sink pilasters so far into the wall as to remove totally, or mostly, the appearance of use. They should always project so much from the wall, as to have the appearance of supporting the entablature over them.

258. Of all the ornaments in great buildings pillars are the chief. The destination of a pillar is to support, either in appearance or reality, the entablature. With regard to the form of a pillar it must be observed, that a circle is a more agreeable figure than a square, a globe than a cube, and a cylinder than a parallelopipedon.—This, in the language of architecture, is merely

saying, that a column is a more agreeable figure than a pilaster; and for that reason it ought to be preferred, when all other circumstances are equal. Another reason is, that a column annexed to a wall, which is a plain surface, makes a greater variety than a pilaster. Besides, pilasters at a distance are apt to be mistaken for pillars; and the spectator is disappointed on his nearer approach.

259. The only circumstances that can serve to distinguish one order from another, are the form of the column and its destination. To constitute the first a distinguishing mark, without regard to the other, would be to multiply orders without end. Destination is more limited, and leads us to distinguish three kinds of orders: namely, the robust, the elegant, and the rich. These the Greeks have embodied in their Doric, their Ionic, and their Corinthian. The Romans, restless after innovation, and desirous of being themselves originators in the art, would have an order more robust than the robust, and another richer than the rich. Hence their Tuscan, which a musical man would call a variation on the theme of the Doric; and their Composite, which is any thing but an improvement on the Corinthian.

260. The ornaments of these three orders ought to be suited to the purposes for which they are intended. Plain and rustic ornaments would not a little jar with the richness of the Corinthian order, and sweet and delicate ornaments no less with the strength of the Doric.

261. There are two general rules with respect to buildings of every kind. One rule, dictated by utility, is, that they be firm and stable. Another, dictated by beauty, is, that they also appear so; for every thing that appears tottering, or in hazard of tumbling down, produces in the spectator the painful emotion of fear, instead of the pleasing emotion of beauty; and, accordingly, it should be the great care of the artist, that every part of his edifice not only be well supported, but likewise appear to be so. Some have introduced a conceit in architecture, by giving parts of buildings the appearance of falling; of this kind is the church of St. Sophia in Constantinople: the round towers in the uppermost stories of some Gothic buildings are in the same false taste.

PART IV.

OF THE OTHER NECESSARY OR ORNAMENTAL PARTS OF BUILDINGS.

Sect. I.—Of Persians, Caryatides, and Termini.

262. Along with columns and pilasters, it is sometimes customary to employ representations of the human figure to support entablatures in buildings. The male figures are called Persians; and the female Carians, or Caryatides. (See plate IX.)

263. The Persians are so called from a victory gained over the Persians by Pausanias, who having brought home prisoners, spoils, and trophies to the Athenians, they fixed upon Persian figures for those which should support entablatures, and thus kept in mind that there were once Persian slaves in Athens. To represent these conquered people in the lowest state possible, they loaded them with the heaviest entablature, viz. that of the Doric order. In process of time, however, other figures besides those of Persians were introduced, and other entablatures put over them; but the name was still retained.

264. The proper Caryatides are women dressed in long robes, after the Asiatic manner; and the origin of the device was similar to the former. The Carians had been long at war with the Athenians; but, being at length totally vanquished, their wives were led away captive; and to perpetuate the memory of this event, trophies were erected, in which figures of women, dressed in the Caryatic manner, were used to support entablatures like the Persians; and, though other female figures were afterwards used in the same manner, the name of Caryatides was always retained.

265. The ancients made frequent use of Persians and Caryatides, and delighted in diversifying them a thousand ways. The modern artists have followed their example; and there is a great variety of compositions of this kind to be met with in different parts of Europe. Indecent attitudes, distorted features, and all monstrous productions, of which there are many examples in gothic buildings, ought to be avoided. On the contrary, the attitudes should be simple and graceful, the countenance always pleasing, though varied and strongly marked, and the draperies more or less ornate, according to the nature of the order employed in the other parts of the structure, or according to the general style and destination of the structure itself.

266. At the same time, however, that we give, for the benefit of the student, the preceding regulations, we cannot avoid expressing our own individual opinion, that this species of embellishment is in decided bad taste, inasmuch as it is emblematical of situations and feelings painful and repulsive. The degradation of the human creature, which is depicted hereby, combined with the degree of physical labor which the imagination is constrained to imply, interferes with and contradicts that impression of fitness and agreeableness which it should be the main desire of the architect to excite.

267. Termini (see plate IX.) are sculptured figures, resembling in shape a stone placed upright, and which, increasing in width towards the top, terminates in a head or bust. These figures, which are also often denominated by the name of Hermes, were generally set up by the ancients to adorn places for the exhibition of gymnastic exercises, of which Mercury, or Hermes, was esteemed a protecting deity.

Sect. II.—Of Pediments.

268. Among the Greeks, pediments were exclusively devoted to ornament the ends of the roofs of their temples. Each end of the roof was finished with a triangular pediment, ornamented with the mouldings and sculpture of the upper part of the entablature; and the flat portion within was decorated by figures in high relief. Such were the pediments of the temple of Minerva Parthenon at Athens, and of the temple, of Jupiter Panhellenius in the island of Egina

which was recently discovered by Messrs. C. R. Cockerell and Foster. The fragments of sculpture which decorated the former, and are now in the British Museum, are proofs of the high perfection to which architectural or pedimental sculpture was brought by the Athenians during the brilliant era of Pericles. The Romans, in the time of the Republic, confined the use of pediments to their sacred buildings, till Cæsar obtained leave to cover his house with a roof terminated by a pediment, after the manner of temples. (See sect. 75). The use or invention of the pediment arose originally from necessity, being the fastigium or gable end of the building; but it afterwards became so purely ornamental, that Cicero says (de Oratore, lib. iii. cap. 46.) that if a temple like the Capitol were to be erected in heaven, where it never rains, it would be covered with a roof, and ornamented with pediments. Among ancient examples are found two sorts of pediments, the triangular and the circular; the former only in good examples, and the latter in those of an inferior taste. The triangular or pointed pediment is promiscuously applied to cover large or small buildings: but the latter, being of a heavier figure, is never used but as coverings to doors, niches, windows or gates. As a pediment represents the termination of the roof, and in the best examples partakes of its shape, it should never be employed but as a finishing to the whole composition.

269. The ancients introduced but few pediments into their buildings; generally contenting themselves with a single one to adorn the middle or principal part, and in the purer times of the Greeks only at the ends. But some of the moderns, particularly the Italians, have been so immoderately fond of them, that their buildings frequently consist of scarcely any thing else.

270. Girders are the largest pieces or beams of timber used in the construction of floors and ceilings. In a roof this piece is mostly called a tie-beam, being used for the purpose of tying the lower extremities of the rafters together, and to prevent them from spreading. It is therefore an impropriety in style, and bad construction in architecture, to intermit the horizontal bed-moulding of the pediment, which represents this important member, to make room for a niche, an arch, or a window.

271. In good architecture no other form of pediments ought to be admitted besides the triangular and circular. The former is truly the only legitimate one, and the most beautiful; but Palladio, Wren, and Chambers, give some authority to the latter as decorations to windows. When a range of such windows are introduced, the triangular and circular pediments may be used alternately; as in the niches of the Pantheon at Rome, in those of the temple of Diana at Nismes, in the Strand front of Somerset-house, and other ancient and modern examples.

272. The proportion of pediments depends upon their size; for the same proportions will not do in all cases. The pediments of the Greeks are lower and in better proportion than those of the Romans, but both partake of the form of the roof. The less humid clime of Greece allowed the roof to be flatter than that of Rome; and it was higher or lower according to the order. The materials of the roof should also be attended to; for if it be covered with tiles, it will be necessary to raise it more than one quarter of the base, as was the custom of the ancient Etrurians in their Tuscan temples.

273. The tympan or tympanum is the flat part or wall in the interior of the pediment, between the two inclined cornices and the bed-mould, and should always be perpendicular with the front line of the frieze. It forms the ground for the figures, when the pediment is ornamented with sculpture.

Sect. III.—Of Gates, Doors, and Piers.

274. There are two kinds of entrances to buildings: viz. gates and doors. The former serve indiscriminately for horses, carriages, and foot-passengers; the latter only for the passage of persons on foot. Doors are used as entrances to churches and other public buildings, to common dwelling-houses and apartments; and gates serve for inlets to cities, fortresses, parks, gardens, palaces, &c. The apertures of gates being always wide, the upper parts are generally made in the form of an arch, that figure being the strongest. But doors, which are mostly of small dimensions, are commonly parallelograms, and closed horizontally. The general proportion for the apertures, both of gates and doors, whether arched or square, is that the height be about double the breadth.

275. The most common, and indeed almost the only ornaments for gates are the piers by which they are supported; and which were originally no more than bare posts into which the hinges of the gates were driven. Though this, however, is the only proper use of piers, it should be concealed as much as possible, and they must seem as if placed there only for ornament. (See plate VII.) As they are to be fixed to the wall before the house, so they must be proportioned to it; and as they are to be seen in the same view with the front of the house, their correspondence with it is equally necessary. They should always be placed upon a plinth, and something must be allowed by way of ornament and finishing at the top.

276. A degree of fancy may be employed in the decoration of piers; but it will be proper to observe this general rule, that the pier being an inferior structure, it must never be richer in ornament than the front of the house. If, for instance, the front of the house be ornamented with the Doric order, the Ionic must not be used in the piers; and it may be better to omit columns altogether than to make use of the Tuscan order for piers in any case. If the Ionic or Corinthian orders are employed in the front of the house, the Doric or Ionic may be used with propriety in the decoration of the piers. One piece of ornament is almost universal in gate-piers of large dimensions; namely, a niche with a seat, for the use and convenience of the traveller. On this account it will be proper to raise the columns on pedestals, or a stylobate, because the continued moulding from their cornice will form a good ornament under the niche. The base of the columns in such instances, of

whatever order they may be, the Doric excepted, are best of the Attic.

277. Inside doors, however small the building may be, should never be narrower than two feet six inches; nor need they in private houses, unless for rooms of large dimensions, ever exceed the width of three feet six inches, which is more than sufficient to admit the most bulky person. The width, however, should always be in proportion to the size of the rooms, and they should never be less in height than six feet three or four inches; otherwise a tall person, or one with his hat on, cannot pass without stooping. In churches, palaces, &c. where there is a constant ingress and egress of people, the aperture must be larger. The narrowest dimensions that should be given to a gateway are eight feet six inches, or nine feet, which is but just sufficient for the passage of a coach.

Sect. IV.—Of Niches and Statues.

278. In almost every age, since architecture became subject to rules, it has been customary to enrich different parts of buildings with representations of human figures. Thus the ancients decorated their temples, baths, theatres, and other public edifices, with statues of their deities, heroes, and legislators. The moderns still follow the same custom, and place in their churches, palaces, public halls, and other similar structures, statues of illustrious persons, and even groups composed of various figures, representing celebrated occurrences and events, related in history or poetry. Sometimes these statues or groups of figures are detached from the ground, or as sculptors call them, in the round, raised on pedestals, and placed contiguous to the walls of a building, or in the middle of a room, court, or public square. But they are most frequently placed in cavities made in the walls, called *niches*.

279. Niches are of two sorts: the one formed like a parallelogram, covered by an arch in its elevation, and semicircular or semi-elliptical in its plan; the other parallelogrammatic both in plan and elevation. The proportions of both these depend on the characters of the statues, or upon the general form and proportion of the groups to be placed in them. The lowest are at least a double square in height; and the highest should never exceed two diameters and a half of their breadth. This should be divided into twice the bottom diameter for the body of the niche, and half for the head; but a better proportion, unless it be to hold a lofty figure, or candelabra, or a statue on a pedestal, is two diameters including the head.

280. When niches are used alone in a composition, they are generally enclosed in a panel, formed and proportioned like the aperture of a window, and adorned in the same manner, with architraves, cornices, and other dressings. In such case the niche or excavated part is to be carved down to the bottom; but on the sides and at the top, a small space is left between the niche and the architrave of the panel. When niches are intermixed, in the composition, with windows, they may be ornamented in the same manner as the windows, provided that the dressngs, and other decorations of the niche, be of the same figure and dimensions as those of the accompanying windows.

281. If the niches be formed before the statues, that is, if the statues have to be made to the niche, and not the niche for the statue, the size of the latter should be in proportion to the dimensions of the niche which is to contain it. It should neither be so large as to have the appearance of being forced into the niches, like those in Borromini's ill-proportioned church of Santa Maria Maggiore at Rome; nor so small as to seem lost in them, as in the Pantheon. The best proportion for height is that the eyes of the statue should cover the centre from which the head of the niche is struck. The distance between the outline of the statue and the side of the niche should never be less than one-third of a head, nor more than one-half, whether the niche be square or arched; and, when it is square, the distance from the top of the head to the crown of the niche should not be greater than the distance on the sides.

282. Statues are generally raised on a plinth, and sometimes on a pedestal. The height of the plinth should be from one-third to one-half of a head; and that of a pedestal according to the proportion and character of the statue, and decoration of the niche. Pedestals, however, under statues in niches, always look like an afterthought, or that the niche was too large for the statue. They are more proper, when inscriptions are required, which may be inserted on the dado of the pedestal. The character of the statue should always correspond with the character of the architecture with which it is associated. If the order be Doric, statues of Hercules, Jupiter, Mars, Æsculapius, and all male statues representing persons of an heroic, robust, or grave nature, may be introduced; if Ionic, then Apollo, Bacchus, Ganymede, and youthful males of a delicate cast; and if Corinthian, Venus, Flora, and other female deities, of a beautiful nature, should be employed.

Sect. V.—Of Chimney-pieces.

283. Among the remains of ancient architecture, there are very few examples of chimney-pieces to be met with. Neither the Italian, French, or German architects, have eminently excelled in compositions of this kind; but Britain, not using close stoves and hot air-pipes, like the Germans, and requiring more firing than the Italians and French, has, with the aid of many able sculptors, occasionally surpassed all other nations, both in taste of design, and in workmanship. The size of the chimney must be regulated by the proportions of the apartment to which it is to be both of use and ornament. In the smallest rooms, the breadth of the aperture should be from two feet to three feet; in larger, from three feet, to three feet six inches; in rooms which are from twenty to twenty-four feet square, or of equal superficial dimensions, they may be from four feet to four feet six inches in width; in those from twenty-four to twenty-seven feet in length or square, from four feet six inches to five feet; and in such as exceed these dimensions, the opening may be extended to nearly six feet, if in due proportion.

284. The fire-place should always be situated so as to be immediately seen by those who enter the room. The middle of the divisional wall is the most proper situation for the chimney in halls, saloons, and other rooms of passage; but in drawing-rooms, dressing-rooms, and the like, the centre of the back wall is the most eligible situation. In bed-rooms the chimney is best in the middle of one of the divisional walls; and in closets, and other very small apartments, to save room, it is often placed in a corner, as an angle-chimney.

285. Whenever two chimneys are used in the same room, they should be placed either directly facing each other, if in different walls; or if on the same side of the apartment, at equal distances from the centre of the wall. The proportion of the apertures of fire-places of a moderate size is generally a perfect square; in small ones it is a trifle higher, and in larger ones lower in proportion, according to their width.

286. The ornamental or decorative parts of chimney-pieces consist of architraves, friezes, cornices, columns, pilasters, termini, caryatides, consoles, and all kinds of ornamental sculpture, representing animals, vegetables, foliage, arabesques, &c; likewise vases, pateræ, chalices, armorial trophies, masks, &c. In designing chimney-pieces regard should always be paid to the nature of the place to which they are to be adapted. Such as are intended for the use of halls, saloons, guard-rooms, galleries, and other large places, should be composed of large and simple parts, few in number, of distinct and pure forms, and executed in bold relief. But chimney-pieces for drawing-rooms, dressing-rooms, boudoirs, &c. may be of a more delicate and ornamental nature.

Sect. VI.—Of Stair-cases and Hand-rails.

287. Stair-cases ought to be so constructed as to make the ascent safe, easy, and agreeable. To fix on a proper and advantageous situation for a stair-case is often attended with difficulty; but without this the internal convenience and beauty of a house will be much injured. Palladio is of opinion, that the entrance to a stair-case ought to be situated so that the principal parts of a building may be seen before we ascend the steps; and upon this principle it is observable, that a more easy access is gained to the principal apartments on the ground floor.

288. To render stairs easy of ascent, the height of a step, or riser, as it is called, ought not to exceed seven inches, nor in any case to be less than four; but six inches is a very general height. The breadth or tread of the steps should not be less than twelve inches, if it can possibly be avoided, nor should it ever be more than eighteen; and, to render our ascent free from the interruption of persons descending, the length should never be less than four feet, unless in common and small buildings, whose area will not often allow more than three feet; nor should the length, to be agreeable, ever, except in extreme cases, exceed twelve feet. That the ascent may be both safe and agreeable, it is requisite also to introduce some convenient aperture for light, which ought to be as nearly opposite to our first entrance to the stairs as the nature of the building will admit. An equal distribution of light to each flight of stairs ought to be particularly regarded; to which end those apertures or windows, at the landing or half spaces; though the whole is sometimes lighted by a cupola sky-light or lantern.

289. Stair-cases which are circular in plan are variously constructed. Some wind round a newel or cylinder in the middle, and the risers of the steps, in some instances, are straight, and in others curvilineal. Others form a well-hole, or void space in the middle, which affords excellent opportunity for a cupola-light from the top. The same observations may be applied to those stair-cases, whose plans are elliptical. The most common forms, however, are those which are square, or oblong, upon the plan. The ancients paid a superstitious regard to an odd number in their flights of steps, as three, five, seven, nine, &c. in order that in their ascent they might begin and finish with the right foot. Palladio, possibly in the same feeling, allows to the stair-case of a dwelling-house, eleven or thirteen steps to each flight.

290. When a stair-case winds round a newel, whether its plan be circular or elliptical, the following is a good proportion:—the diameter being divided into three equal parts, two of such parts are allotted to the steps, and one for the cylinder or newel. But in circular or elliptical staircases, that are open or constructed with a well-hole in the centre, a good proportion is to divide its diameter into four equal parts, and allot two for the steps, and two for the void space or well-hole in the centre. Modern stair-cases have often a kind of well-hole of a mixed form; straight on the two longest sides, and semicircular at the returns of each flight. The length of these well-holes, is, according to circumstances, but their width seldom exceeds from eighteen inches to two feet.

291. Hand-rails are necessary accessaries to most stair-cases, as well for safety and convenience as for ornament. The hand-rail generally begins from the bottom on a scrolled or cur-tail step, the form of which it follows supported on a carved baluster or column. This scroll or commencement of the hand-rail, if skilfully and tastefully managed, produces a very good effect, and serves to hold a candelabra, lamp, or vase. To assist in the construction of these difficult, but highly ornamental parts of domestic practical architecture or joinery, the following observations are offered to the student for his consideration, illustrated by the various figures in plate X. Figure 1 describes the plan of the first or cur-tail step (so called from representing the curled tail of a dog or cur, and not, as some writers say, from being curtailed or abridged of its proportions; for on the contrary it is enlarged beyond the size of any of the others), formed with a scroll to receive the newel post and balusters of the twisted hand-rail: *a* is the projecting nosing of the step, *b* the thickness of the bracket, and *c* the string board. To draw the scroll, the student must proceed as follows:—Let the space 1, 3, in fig. 1, be considered as equal to the spring of the scroll from its centre to the straight part of the hand-rail, as from O to 1 fig. 3. Divide 1, 3, into

three equal parts; and drawing the line 4, 3, at right angles to 1, 3, make it equal to one more of these parts. Draw then the diagonal 4, 1; and from the centre 4, describe the arch 3, 5. Divide the arch into twelve equal parts; and through these divisions draw the radii till they intersect the line 3, 1, as at 2, 3, 5, &c. which completes the scale for drawing the scroll. Supposing that the several radial lines, 1, 2, 3, 4, &c. in fig. 3, are already drawn, proceed thus: take from fig. 2 the space 3, 2, and place it at fig. 3, from the centre O to 2. With the same opening of the compasses fix one of its feet on 2, and with the other strike a short curved line, as at C; and from 1, with this opening, describe another intersecting it at C. From the centre C thus found, draw the arch, 2, 1. Again, from fig. 2, take the space 3, 3, and place it from O on the radial 3; with this opening, find the centre as before, and draw the arch 3, 2, proceeding in the same way with the rest. By contracting the line 4, 3, in fig. 2, it is evident that a scroll may be drawn more open, or with less convolution, as in fig. 4; consequently by increasing the length, 4, 3, the scroll will acquire more convolution; and therefore we may, by these means, vary the scroll as we please. In fig. 5 is shown the pitch-board, or raking of the steps, in order to determine the falling mould of the twist. The occult or dotted lines drawn from the hand-rail to the pitch-board, show its width, which is to be kept level as it winds about. The lines *a*, 3, *b*, 2, continued round to D, show how much half the width of the rail rises on the pitch-board, from its beginning to 3. D exhibits the same pitch-board; and the method of finding the outside mould for the twist of the hand-rail, after its sides are so squared as to be every way in a perpendicular direction to its ground plan. But this cannot be done without first finding the mould for the hand-rail, which may be done thus:—Consider B in fig. 6, as that part of the plan of the hand-rail comprehended between 1, 3, fig. 5. D is the pitch-board, which gives the rake or bevel of the hand-rail; which, being divided into any number of equal parts, draw ordinates to the plan B, as *a*, *b*. From the raking lines, *e*, *d*, draw the corresponding ordinates at right angles with it; and by the two compasses transfer the several ordinates from 3 to G, as *a*, *b*, to *c*, *d*, and 1, 2, 3, 4, respectively: then, by drawing a curved line through these points, G will become an accurate mould for the upper side of the hand-rail.

292. As, however, the twist of the hand-rail requires a greater substance of material than the straight part, the requisite quantity may easily be determined thus:—Draw the square of the hand-rail on the pitch-board, as *a*, in fig. 7; and parallel lines from the opposite angles will show the thickness required; as at 1, 2. Agreeably to this, *l*, *m*, *n*, in fig. 8, show the manner of glueing the rail with the additional thickness of material before mentioned. It is made of so many pieces, and varied in glueing, to assist in more easily forming the twist. The best method is, in fact, to glue these the straight way of the grain, by which means, if the wood be properly matched, the whole will appear when finished as one solid piece. To reduce these pieces properly, and to produce in the whole twist an agreeable turn, it will be necessary to have a falling mould, that when each part of the twist is so squared, as in every part to answer to a perpendicular line over its plan when placed in its due position, it may be applied to the outside of the rail round the twist.

293. In fig. 5, therefore, consider D the pitch-board, and O, P, the level of the scroll at 3, 4. Take the stretch of a line supposed to be girted from 1 to 3, which transfer to O, P, at D. Divide each side of the angles formed by the raking and level-line into any number of equal parts, as 1, 2, 3, each way, and the points produced by the intersection of the lines drawn from each division, will form a curve perfectly easy and sufficiently accurate for the purpose.

294. If a scroll is required to take its spring from any part of the second step, then draw the pitch-board, as described in fig. 6, and proceed in every particular as before. Fig. 9 is a plan of the hand-rail, including steps, as in cylindrical stair-cases. M is the quarter plan; D is the pitch of five steps; and R the face mould for the hand-rail, if it be cut out of the solid; if otherwise, then veneers are to be glued round a cylinder, made for the purpose, and on which must be marked each step and riser, as shown at A, that the thin steps at *b* for the hand-rail, and those at *a* for the string-board, may be correctly laid down.

Sect. VII.—Of Balustrades.

295. Balustrades, or the plain or carved small columns, or rows of balusters, that protect the edges of stair-cases, balconies, landings, &c. are sometimes of real use in buildings; and at other times they are only ornamental. Such as are intended for use, as when they are employed on stair-cases, before windows, or to enclose and protect terraces, parapets of bridges, &c. must always be nearly of the same height, varying from three feet, their lowest height, to three feet six inches, their highest. But when they are principally designed for ornament, as when they terminate the parapet or blocking course of a building, they must be proportioned in every respect to their situation, and to the mode or order of architecture which they accompany. Their height should be not exceeding four-fifths of the height of the entablature on which they are placed; nor should they be lower than two-thirds thereof, exclusive of the zocle or plinth, the height of which must be sufficient to afford a complete view from below of the whole balustrade.

296. A good method to proportion balustrades, is, to divide the whole intended height into thirteen equal parts, eight of which are to be appropriated to the height of the baluster, three for the base, and two for the cornice or top-rail. One of these parts may be called a module, and, being divided into nine minutes, may serve to determine the dimensions of the particular members. The distance between two balusters should not exceed half the diameter, measured in its thickest part, nor be less than one-third of it.

297. The breadth of the pedestals that are

placed, both as divisions and supports, between the balusters, and often used to carry figures or vases, when they are placed over columns or pilasters, is regulated by them. The dado, or die, should never be broader than the upper diameter of the shaft, nor very much narrower; and, when there are neither columns nor pilasters in the front, the dado should not be much lower than a square, and seldom higher. On stairs, or other inclined planes, the same proportions are to be observed as in horizontal surfaces.

Sect. VIII.—Of Roofs.

298. The roof is a most essential part of a building, particularly in a humid climate. In Egypt roofs are often of stone, and sometimes monolithal, or of one single block, even over temples of a large size. To effect the best construction of a roof, a plan of the building which is to be covered should be made, before the operation of roofing is commenced, in order to ascertain the lengths of the various timbers required for the whole. The principal substances used for covering roofs in England, are, lead, copper, zinc, pantiles, plain tiles, and slates of various kinds and modes of laying them. Coverings of lead are undoubtedly the best and most durable, particularly such lead as was used by our ancestors, before modern art discovered the mode of impoverishing its quality by the extracting of every particle, or suspected particle, of silver from its mass. But, on account of its greater expense, this kind of covering is not often used, except for magnificent buildings or for flats, in which latter case any other sorts, (except copper or zinc) would not be secure against rain; its use being superseded almost invariably, even on our new churches and reparations of the old, by slate. The pitch or perpendicular height of a flat roof need not exceed two-ninths of the width of the building, or rather what is termed pediment pitch; but if wanted to walk upon, it may be lower, so as it affords a current for the water. Pantile coverings may be also used to roofs of a low pitch, if laid to a close gauge, and well pointed; but their general pitch ought not to be less than three-eighths of the width of the building. Coverings of plain tiles and slates require the highest pitch, because when they are laid on flat roofs the rain will more easily find its way between them. These ought to have a pitch, the length of the rafters of which is three-fourths of its base or tie-beam; or at least the ridge of the roof, formed by the junction of the rafters, should be a right angle.

299. There are also various kinds of circular roofs; but those most generally used are constructed in the following manner, being square or parallelogrammatic in their plans and timber framings, as in figs. 7 and 8, in plate X, whose principal component parts are thus named:—A is the tie-beam or girder, which not only supports the principal rafters but ties them in at their feet, and prevents them from spreading. Its geometrical form is the base of a triangle; B the principal rafter or suspar; C the king-post, suspended at its head by the principals, and bearing up the middle of the tie-beam by iron collars and screws; D D, struts. Fig. 1. is a trussed roof of one pitch, with one king and two queen posts, capable of being thrown over a span of seventy feet. Fig. 2 is a compound roof, called an M roof, having a gutter in the middle, over the centre of the tie-beam, calculated for a span of the same extent. These latter kind of roofs are useful in cases where the span is extensive, and the pitch required low. When there is a middle wall, as is common in large dwelling-houses, the roof is made double, as in fig. 9. Fig. 4, 4, shows the method of piecing or scarfing timber, and securing it by metal bolts; fig. 5, the method of trussing a girder or tie-beam with pieces; *a*, *b*; and fig. 6, of trussing a partition.

300. Beams or girders that exceed twenty feet in length, should be trussed in one or more places, as may be required. Beams should not exceed fifteen feet in bearing, without trussing or under support; nor common rafters more than ten feet without purlines under them, morticed and tenoned into the principal rafters, and especially in roofs of a very low pitch, whose coverings have a much greater pressure on their rafters than those of higher pitches, and which may therefore exceed ten feet.

301. If the length of a beam of fir timber be thirty feet, its scantlings should be seven inches deep and six inches wide.

If 45 ft. long, 9 inch. deep, and 6 inch. wide,
60 — 10 — 8½ —
75 — 10½ — 10 —
90 — 12 — 10½ —

302. If the length of a principal rafter be twenty-four feet, its scantlings should be six inches deep, and five inches wide.

If 36 ft. long, 7 inch. deep, and 6 inch. wide,
41 — 9 — 7 —
60 — 10 — 7½ —
72 — 10½ — 9 —

303. Rafters of these dimensions are generally made about one inch, or one inch and a half, larger at the bottom in depth, which strengthens the roof by admitting larger tenons into the principal beams, and by becoming lighter at the top.

304. If the rafters be small, as eight feet in length, their scantlings may be four inches and a half, by two inches and a half wide.

If 10 ft. long, 5 inch. deep, and 2½ inch. wide,
12 — 6 — 3 —
14 — 6½ — 3 —

Sect. IX.—Of Ceilings.

305. Ceilings of churches, halls, temples, galleries, and other vast buildings or apartments, occupying the whole of the building, may be considered, architecturally, as the interior surface, or lining of the roof which covers them; as there is nothing between them but the necessary framing by which the whole construction is supported. For the common apartments of dwelling-houses, such as the dormitories, rooms of actual business, and, in fact, for all rooms but those of state, the simplest and most usual form of ceiling is flat. This is generally divided into principal and accessorial compartments, surrounded by mouldings, either recessed into the plane of the ceiling, or raised upon it. The ornaments and mouldings do not require a bold relief; but being

near the eye, they must be designed with taste, and executed with neatness and accuracy.

306. Coved ceilings, for lofty apartments, are more beautiful than flat ones; but their execution is attended with more expense. They may be used indiscriminately for large and small rooms, and should be from one-fifth to one-third of the height of the room. The figure of the cove should be either a quarter of a circle, or of an ellipsis, taking its rise a little above the cornice, and finishing against the border or frame, round the great panel in the centre. The border should project somewhat beyond the coves on the outside; and on the side towards the panel it is generally made of sufficient depth to admit the ornaments of an architrave.

307. When the profiles or mouldings of rooms are gilt, the same portions of the ceiling ought likewise to be gilt. The usual method is to gild all the ornaments, and to leave the ground white, pearl color, light blue, French gray, or of any other delicate color that may be proper to set off the gilding to advantage

308. Historical and other paintings are often introduced with good effect in the centre and angular compartments of large ceilings; and of late an invention of painted silk and satin in various ornaments, after the antique, has been used in the decoration of the panellings of rooms with good effect. These are enclosed in panels, pilasters, and tablets, according to their situation; and, when they have suitable gilt mouldings, they produce a very pleasing, and indeed splendid effect.

PART V.

OF THE ERECTION OF BUILDINGS IN GENERAL.

Sect. I.—Of the Principles to be observed in Erecting Buildings

309. The rules of building require that in every fabric there should be solidity, convenience, and beauty; to which, according to some of the most refined masters, are added, order, disposition, proportion, decorum, and economy. These several particulars are considered by the most skilful architects as absolutely necessary in the planning, erecting, and finishing, an entire fabric.

310. *Solidity* in architecture implies the choice of a good foundation whereon to build, proper materials wherewith to work, and a judicious application of the two means to the end which is to be obtained. *Convenience* demands such a disposition of the various parts of an edifice, that they may not so crowd and embarrass each other as to appear discordant in their proportions, or disagreeable to the eye of the spectator. Of *beauty* we have already treated in various parts of this article. *Order* gives to each part of the building a proportionate extent; such as is adapted and agreeable to the whole *Disposition* is the due arranging, and agreeable union, of all the parts. *Proportion* is the relation that the whole work has to its constituent parts, and which each part has to the complete idea; for, in buildings that are perfect in their kind, from any particular part we may form a tolerable judgment of the whole. *Decorum* consists in making the whole aspect of the fabric so correct, that nothing shall appear but what is founded on the principles of reason, geometry, and delicacy of judgment. It includes design, or the choice of one situation in preference to another; and directs us to pitch upon different prospects or views for different parts of an edifice. *Economy* instructs the architect to have regard to the expense of his design, which will be greatly effected by a choice of such materials as are not only of a kind proper for his purpose, but of the cheapest of that kind.

Sect. II.—Of Foundations.

311. The best foundation is that which consists of gravel or stone; but in order to know whether the inferior strata are sufficient for the support of the building, it will be advisable to sink wells at some little distance. By attending to what is thrown up in the digging of these shafts, the architect will learn what strata lie under the stony or gravelly bed which on the surface seems to promise so much security, and will know what measures to adopt.

312. But, though a stony or gravelly bottom is undoubtedly the best for a foundation, as being the most sure and firm, where all is sound beneath, there is, at the same time, no kind of ground which may prove more fallacious, or occasion such fatal accidents. The reason is, that such soil often contains beneath its surface absolute vacuities, that fail when built upon. Nor is rock itself, although 'a building founded upon a rock' is strong even to a proverb, free from danger of the same kind. Caverns are very frequent in rocky places; and should a heavy building be erected over one of these, it might suddenly give way and the superstructure fall in altogether.

313. To guard against accidents of this kind, Palladio advises the throwing down great weights forcibly on the ground, and observing whether it sounds hollow, or shakes. He says, if a drum be placed on the suspected ground near to a vessel filled with water, a gentle stroke will not resound nor ruffle the surface of the water, if the earth be solid; but, if it be hollow, the effects produced will very clearly show it.

314. When the foundation is gravel it will be proper to examine the thickness of the stratum, and the qualities of those strata that lie under it, as they have appeared in digging. If the bed of gravel be thick, and the under strata of a sound and firm kind, there needs no assistance; if otherwise, recourse must be had to various methods in order to supply the defect. In the case of boggy earths, or unfirm sand, piling is one of the most common methods of securing a foundation; and, notwithstanding the natural disadvantages in such a case, piles, when properly executed, are exceedingly firm and secure.

315. In foundations near the edge of waters, or swampy places, soundings or borings should always be made to the very bottom, as many fatal accidents have happened from the foundation being undermined by water. The same method is to be followed when the ground which is to be built upon has been dug into, or wrought

before. It ought never to be trusted in the condition in which it is left; but it must be dug through into the solid and unmoved ground, and some way even into that, according to the nature of the soil, and to the weight and size of the intended edifice.

316. It will be proper, however, before the architect begins to lay the foundation of his building, to construct such drains as may be necessary for carrying off the rain or other water, that would otherwise be collected and lodge about the house. In forming drains for carrying off this water, it will be necessary to make large allowance for the different quantities that may be collected at different times. It must also be considered, that water of this kind is always loaded with a vast quantity of sediment, which, by continually falling to the bottom, will be very apt to choke up the drain, especially at those places where there happen to be angles or corners in its course. The only method of preventing this is by means of certain cavities, disposed at proper distances from one another. Into these cavities the sediment will be deposited, and they are for that reason called cess-pools.

317. All drains ought to be arched over at the top, which is most conveniently executed of brick. According to their different sizes, the following proportions of height and thickness ought to be observed. If the drain be eighteen inches wide, the height of the walls may be twelve inches, and their thickness nine inches, or one brick. The bottom should be paved with bricks laid flat ways, and a little concave, and the arch turned over the top four inches and a half, or half a brick in thickness. If the drain be twenty-two inches wide, the side-walls should then be fifteen inches in height, and the rest constructed as directed above. If it be fourteen inches wide, the height of the walls should not be less than nine inches, and the rise or versed sine of the arch, four inches. A drain or sewer of three feet wide, should be about the same height as it is wide, and the arch which covers it over should be nine inches, or one brick's length in thickness. Upon the same principles and proportions, other drains of any size may be constructed.

318. The sewers and drains being constructed in a manner proportionable to the size and necessities of the intended building, the architect may next proceed to lay the foundation of the walls. Here his first care ought to be, that the floor of the foundation be perfectly smooth and level. The Italians begin with laying over it an even covering of strong oak plank; and upon that they lay, with the most exact care, the first course of the materials with which they form the footings. Whether this method of planking the foundations, or of commencing upon the naked soil or floor of the foundation, be adopted, the whole of the footings, with their sets-off laid seriatim, must be laid with the greatest accuracy by line and rule. When planking, or planking upon sleepers, which go across the foundation at right angles to the plankings is used, the first course of bricks or stone is best laid without mortar and with the closest cross joints, as mortar is deleterious to timber, which otherwise would endure for ages in a tolerably good soil.

319. The thickness of foundation walls or footings, in general, ought to be double that of the insistent walls, which they have to support, and set off gradually by steps on each side, till they arrive at that of the intended walls; and this footing ought to be at least six inches, or two courses of bricks, below the level of the floor of the lower story. The looser the ground is, by so much more, in proportion to the badness of the natural foundation, should the thickness and depths of the footings be; and it will require a similar proportionate addition each way, according to the intended height of the wall that is to be erected upon it; or, if a building, of the weight such building is intended to carry. The plane of the ground should be perfectly level, in order that the weight may press equally everywhere; for where it inclines more to one side than another, whether in length or breadth, the wall will split, and occasion what are called settlements. The footings or foundation-walls, should diminish seriatim, and equally on each side, as they rise; and the perpendicular should be exactly kept in the lower and upper parts of the walls; which caution should be observed all the way up, wherever sets-off or diminutions of thickness occur, with the same strictness. In some soils the foundations may be arched on proper piers, which will save materials and labor, at the same time that the superstructure has an equal security. This practice may peculiarly be adopted when the foundation is piled; when the piers may be placed in situations accommodated to the necessity of the case, and upon the heads of the piles.

Sect. III.—Of Walls, Chimneys, Roofs, and Floors.

320. As the foundation-walls or footings are to diminish in thickness, seriatim, as they rise, so are also the walls which are to be built upon them. This is necessary to save expense, but is not absolutely so to strengthen the wall; for it would be no less strong though it were continued all the way to the top of an equal thickness, provided the perpendicular be exactly kept. In common dwelling-houses, built of brick, the general diminution from the bottom to the top is regulated in the metropolis and surrounding neighbourhood, in what is called the bills of mortality, by the standard regulations of the building act of parliament; but a good proportion, where the provisions of such act do not extend, is to begin in the lower story two bricks in thickness; then one brick and a half; and lastly, one brick in thickness. In larger edifices the walls must be made proportionably thicker; but the diminution should be preserved after the same manner. When stones are used in the construction of walls, instead of bricks, regard must be paid to their nature, and to the propriety of their figures for holding one another; and where the wall is to be constructed with different materials as hewn and rough stone, or stone and brick, the heaviest should always be placed undermost.

321. One additional particular respecting the strength of a plain wall is to be observed; namely

to fortify its angles. This is best done with good squared stones on each side, which not only afford considerable strength, but a great deal of beauty. Pilasters or piers, properly applied, give great strength to walls. Their best distance is about every twenty feet, and they should project from four and a half to six inches from the surface of the wall. Every opening in a wall contributes to weaken it; and, as the corners require to be the strongest parts, there should never be a window or a door very near to a corner.—The distance of any opening from an angle should always be at least the width of the opening itself.

322. Together with the construction of walls, the management of chimneys should always be considered; for errors in the construction of these will render the most elegant buildings extremely disagreeable. The common causes of *smoking* in chimneys are either that the wind is too much admitted into the mouth or lower extremity of the funnel, or that the smoke is stifled below; and sometimes, a higher building, or a considerable elevation of trees or of the ground contiguous to the building, is the cause of the mischief; or, lastly, the room in which the chimney is may be so small or close, that there is not a sufficient current of air to drive up the smoke. The best method is to construct the lower part of the chimneys with an easy chamber for the smoke, to diminish therefrom afterwards with a gentle diminution to the regular flues, which must turn in every respect gently and not suddenly. This will always choke the current of smoke. In fact a well-constructed chimney should resemble in elevation a narrow river in plan; for where the water would be choked in the one case, the smoke would be so in the other; and in places where eddies and curls would be formed in the one instance, so would it in the other. For curing smoky chimneys in houses already built, see CHIMNEY.

323. After the walls are finished, the roof is the next consideration. This subject, as far as carpentry is concerned, was treated in sect. VIII. plate 4; little more need be said concerning it under this section, than that its weight should be calculated in proportion to the strength of the walls. It should also be so contrived as to press equally upon the building; and the inner or cross-walls should also bear their proportion of the weight as well as the outer ones. A roof should neither be too heavy nor too light; for being necessary in keeping the walls together by its pressure and ties, it will be incapable of doing so if too light or fragile; and if too heavy, it is in danger of throwing them down. Of these two extremes, however, the last is most to be dreaded.

324. Floors are most commonly made of wood; and it is necessary that it be well seasoned, by being kept a proper time before it is used. The floors of the same story should be all on one level; without even a threshold rising above the rest; and if in any part there should be a room or a closet, the floor of which is not perfectly level, it ought not to be left so, but raised or lowered, as the case may be, to any equality with the rest; what is wanting of the true floor being supplied by a false one.

325. The lower floors of common cottages or laborers' dwellings, may be made of a composition of clay, bullocks' blood, and a moderate proportion of sharp sand. These three ingredients, beaten thoroughly together, and well spread, make a firm good floor, and of an agreeable color. For better houses floors of this nature may be made of plaster of Paris, or calcined gypsum, beaten and sifted, and mixed with other ingredients. This cement may be colored to any tint by the addition of coloring materials; and when well worked and planished with floating and finishing trowels, it makes a very beautiful floor. Besides these, halls, and some other good rooms, may be paved or floored with marble or stone, either plain or dotted with black or dark-colored quarries. At present the general use of carpets has, in a great measure, superseded the custom of laying ornamented or inlaid floors. In country buildings, floors are very frequently made of a sort of brick called paving bricks, and tiles; the latter varying from ten to twelve inches square, and about an inch, to an inch and a quarter, in thickness. These, according to their shapes, may be laid in a variety of figures, as the herring-bone, the alternate oblong, &c.; and they are also capable of some variety of color, according to the nature of the earth from which they are made. They may be laid at any time of the year, but those of earth or plaster are best made in the beginning of summer, for the sake of drying.

SECT. IV.—OF THE DISTRIBUTION OF THE APARTMENTS OF HOUSES, &c.

326. The distribution of the apartments of houses must, of necessity, be directed by the way of life in which the inhabitants are engaged. In the country their occupation is most commonly farming; and therefore, besides the house for the family, there are also necessary, barns for the reception of the produce of the ground, stables for the horses, stalls, &c. for the cattle, cart-houses for keeping the vehicles and utensils under cover, and a variety of sheds and stalls for other uses.

327. To accomplish these purposes, a good proportion is, to take a piece of ground of five times the extent of the front of the house, and enclose it in a proper and economical manner. In the central part of the rear of this area place the house; and in front of the ground the barns and stables, with the adjoining sheds. These are best situated, one range on each side, to the extremities of the enclosed ground. They will thus fill up a part of the entrance, and leave an area about and in front of the house, for the purpose of a farm-yard. From the barns to the stables, a fence, with entrance gates in the middle may be extended. The entrance ought always to be in front of the house.

328. The plan of the house and out-buildings may be arranged as follows: The entrance door should enter into a passage, paved with bricks; at the end of which the stair-case may be conveniently placed. On one side of the passage should be the common kitchen; and on the other side a corresponding large room, that may serve the family by way of dining or living room. Beyond this may be the pantry and dairy, the

last being twice the size of the former; and both with a northern aspect, and on the same side with the parlor, that they may be away from the heat of the kitchen, which renders it improper to be near them. More rooms may be added on the ground story, as occasion may require; and the upper story divided into bed-chambers for the family, with dormitories, formed in the roof or attic story, for the use of the servants.

329. A gentleman's country house or seat should, of course, be built on a more extensive plan, and after a more ornamental style of architecture. In such case the front may extend from sixty to seventy feet in length; the depth of the main building may be forty feet, and in each of the wings from forty-five to fifty feet. The offices are best distributed in the wings; the kitchen and its offices in the one, and the stables in the other. Both of these, however, should correspond with each other in every respect, and in style and due proportion with the body of the building to which they are accessorial adjuncts. These wings may project about thirteen or fourteen feet from the main body of the house to which they are to be connected, either by straight or curved lines, or walls or rows of columns. A good proportion for these wings, if belonging to a house of sixty-five feet front, is about thirty-five feet, with a depth of forty-five feet. If they are smaller, the house will look gigantic; if larger, they will lessen its aspect.

330. It is well also to have a covered communication between the dwelling-house and the wings or offices, which should not have the appearance of a plain blank wall, but should be ornamented by gates, and other openings or breaks. The archway by which the offices are connected with the dwelling-house, should be proportioned to the extent of the building; and there can scarcely be a better proportion than that of five feet within the angles of the buildings. The wings, which have only a projection of thirteen feet, will appear to have one of eighteen, and the light and shade will be agreeably diversified.

331. As to the internal distribution of a house of this kind, the lower story may be conveniently divided into three front apartments: the hall, which should be in the centre, may occupy the whole of the projecting part, having a room on each side; the length of the hall should be about twenty-four feet, and its breadth twelve, being a double cube in proportion. The rooms, on each side, should be sixteen feet each in length, and eleven wide; of these two front rooms, that on the right hand may be conveniently adapted to the purpose of a waiting-room for persons of rank; and that on the left-hand as a dressing-room for the master of the house. Behind the hall a passage may be constructed of about four feet and a half in width, leading to the apartments in the rear of the house, and to the stair-case. These may be disposed as follows:—immediately behind the hall and the passage the space may be occupied by a saloon of twenty-four feet in length, and seventeen in breadth. On the left-hand of the passage, behind the hall, is to be placed the principal stair-case; and, as it will not occupy the whole depth, a pleasant common parlor may terminate that side of the house. On the other side, the passage should lead to the door of the principal dining-room, which may occupy the whole space.

332. The wing on the right-hand may contain the kitchen and offices which belong to it, and the other the stable offices. The front of the right-wing may be entirely occupied by the kitchen, which will then be thirty feet long, and sixteen feet and a half wide; or it may be rendered smaller by taking off a small room to the right; twenty-two feet by sixteen will then be its size. The other room will then have a length of sixteen feet parallel to the depth of the kitchen, and the width to the front will be seven feet six inches. Beyond the kitchen will be a good situation for a stair-case, for which seven feet six inches will be a suitable allowance; and to the right of this may be a scullery eleven feet ten inches deep, from the rear front, by seven feet in depth. To the left of the stair-case is a proper site for the servants' hall, about sixteen feet square, and behind that a larder twelve feet ten inches, by fourteen feet six inches. In the centre of the other wing may be a double coach-house, for which there should be allowed the whole breadth of the wing, with ten feet six inches in the clear, and on each side may be the stables.

PART VI.

OF AQUATIC ARCHITECTURE.

Sect. I.—Of Stone Bridges.

333. Bridges generally form the continuation of a street or highway over a river, canal, brook, or marshy ground; and sometimes over dry ground, to form a connected street between two rising grounds, such as the North and South bridges of Edinburgh. Bridges that are merely a part of the high road, may be built in a cheap and rude manner; but when they take their direction from a principal street in a capital city, their construction is attended with considerable expense; and a degree of elegance and durability is required in their formation, that demands the utmost skill and ingenuity of the architect.

334. Palladio, in his third book, tells us that bridges ought to have the same qualities that are judged necessary in all other buildings, namely, that they should be convenient, beautiful, and lasting. The perfection of a bridge consists in its having a good foundation, which makes it lasting; an easy ascent to the crown of its central arch, which makes it convenient; and just proportion in its several parts, which renders it beautiful. When the architect is not absolutely confined to any particular situation, he ought to choose that part of a river which has its course narrow and shallow, and is the most promising for a good foundation. A straight current, where the shore does not wind, and possessing at the same time the farther advantage of a level and rocky bed, is the most eligible.

335. In erecting bridges of stone, there are three or four particulars which should principally claim the attention of the architect:—1. The abutments should not only receive the pressure of the arches with which they are connected, but they must also be capable of resisting the force of the

whole combined together. Hence the necessity of a solid foundation on the opposite sides of the river, without which the several arches will be liable at least to partial rents, if the whole does not entirely give way. 2. The direction which the whole structure is to take across the river is to be attended to; and this ought always to be at right angles with the current, in order that the stream may more easily pass through each arch without injuring the piers. 3. The size of the piers must be considered, which ought not to be larger than what is essentially necessary for the support of the arches; because the unnecessary thickness of piers has the effect of contracting the water-way, and increasing the current of the water, and consequently its velocity, thus rendering the foundation of each pier more liable to be undermined. 4. The architect should decide with mathematical precision upon the dimensions, number, and figure of the arches, which are points of great consequence to the whole, in relation to strength, utility, beauty, and economy.

336. Where there is a strong current and much navigation, with elevated ground on each side, wide arches are preferable on many accounts. They afford a more easy passage to vessels, and, being formed with a smaller number of piers, become less expensive, prove a less hindrance to the current of the water, and in some respects, are safer than those bridges which are built with narrow arches. These, perhaps, were among the reasons which induced many foreign architects to choose only one arch, even in cases where there was sufficient room and occasion for more. We read of a bridge in China, whose abutments are two opposite mountains, having but one arch, the chord of which is four hundred cubits, and its height, or versed sine (we suppose measured from the surface of the water and its perpendicular piers included), five hundred cubits.

337. But, on the other hand, where the ground is low on each side, a very wide arch would not be the most proper, if considered in regard to the road-way over it. For, as a semicircle is not only one of the most beautiful forms of arches, but at the same time one of the strongest, to choose an extensive radius, would occasion the middle part of the road way to be so high, as to render the passage for carriages extremely difficult. To obviate this, by changing the figure of the arch into an ellipsis, is, in some respects, an impropriety, as it is not so strong nor so beautiful as the former; yet it may be allowed, when a river is narrow and its banks extremely low. In such case, the danger will often lie in the abutments; for arches, which are either elliptical or small segments of circles, press their abutments in proportion as their height is to their length. When, therefore, the architect cannot depend upon his abutments, though the river be narrow, the number of arches must be increased, and their figure might better be a semicircle; as it is self-evident, that such arches press more perpendicularly on their piers, and in proportion to their number, will relieve their abutments.

338. The ancients, as well as the moderns, assigned to a bridge an even number of piers, in order that an arch and not a pier, may be over the centre of the river. This is, indeed, not founded merely on the principles of beauty, but of philosophy and utility; since, in general, it is found that the strongest current runs in the centre of a river; which, therefore, clears itself in the aperture of a bold arch, and makes it less dangerous to the piers nearest the centre.

339. The size of the piers must be governed by that of the arch, and, according to Palladio, they should never be less than one-sixth part of its width, nor more than one-fourth. Piers for bridges are generally hexagonal upon their plan, having two long sides parallel to each other, and at the ends of them are placed two short ones, facing the course of the stream, at right angles to each other, and called cut-waters. Palladio says they may be sometimes made semicircular, facing the stream in order to divide the water, and that those things which are impetuously floated down the river when they strike against them, may be thrown off from the piers, and passed through the centre of the arch.

340. As the proper dimensions of the key-stones or archivolts, the same able architect gives to their height a seventeenth part of the width of the arch. This proportion is somewhat smaller than that allowed by Gautier, an experienced French engineer, who gives to the length of the voussoirs or arch stones, of an arch whose chord or opening is twenty-four feet, a length of two feet, or one-twelfth; and to arches of the various widths, or the chords of whose arcs are respectively forty-five, sixty, seventy-five, or ninety feet, he gives three, four, five and six feet respectively, and more than this when the stone is of a soft nature. But Belidor, who is a good theoretical authority, gives as a proportion that the length of the key-stones ought always to be a twenty-fourth part of the width of the arch, whether the stone be hard or soft, because, he says, if it be soft their weight is proportionably less. This rule, however, is bad in practice, and inferior to that of Gautier, which regulates the depth of the voussoir according to the length of the chord of the arch. The practical rule of Perronet, which has been ably followed by Rennie, Dodd, and other recent English bridge builders, of the internal line of the arch forming a different curve from the external line of the voussoirs, called the extrados and intrados of the arch, is better than either, and has been well executed over the Seine at Neuilly, near Paris. A better specimen, on the same principles, is Waterloo bridge, executed in fine granite, over the Thames near Somerset-house. The principle of the depth of the voussoir being larger at the springing of the arch than at the key-stone, is founded upon that mentioned in para. 303, in observing upon the propriety of making the bottom part of a rafter larger than the top. Dr. Hutton has given some excellent theoretical rules in a little treatise, concerning the intrados, extrados, and curves of arches, which are worth the most serious attention of the architectural student, who would design a secure and economical arch.

341. It may appear somewhat strange, that scientific men should differ so widely about the

depth of the key-stone. The most illiterate pretenders to the science could scarcely vary more in their opinions respecting the due proportion of the voussoirs and depth of the key-stone, than to make such a difference as between one and two feet in an arch of only twenty-four feet wide. To what can such an extraordinary difference be attributed, but to sheer ignorance, or to ridiculous caprice. As a proper medium between these extremes, the judicious proportions of Palladio, who, as a learned architect was of course a skilful engineer, may be safely recommended to practice, if united with Perronet's improvement of the diminution of the voussoirs from the bed to the crown. This proportion in a bridge over a river of 130 feet wide between the abutments, he divided into three arches, giving sixty feet to the centre arch, and forty-eight feet to each of the other two. The piers, which he calls pilasters, he makes twelve feet in width, or one-fifth of the width of the middle arch, and a fourth of the smaller ones. The arches he forms of a segment, somewhat less than a semicircle; and their archivolt, or depth of voussoir, one seventeenth part of the chord of the centre arch; and a fourteenth part of the other two. According to this proportion, the key-stone of his centre arch should be three feet six inches in depth, but upon the principles of Gautier it would be four feet, and upon those of Belider only two feet ten inches. In an arch whose chord is twenty-four feet, Palladio's rule makes the depth of the key-stone a trifle more than eighteen inches, which is a much more eligible proportion than either the twelve inches of Belidor, or the twenty-four inches of Gautier.

342. Upon the proper thickness of the key-stone, or the depth of the voussoir or arch stones, ancient writers on architecture say nothing; nor have the moderns at present settled any determined rule. Dr. Hutton is too theoretical, although he is a profound mathematician; and the few practical men who have hitherto published their speculations, have been too merely workmen, to give true data on which the builder may safely depend in every instance. The union of the architect and the mathematician, so as to unite science with taste, is the desideratum for the true bridge-builder. This silence of the ancients upon such a subject, which they practised so well, must arise from a loss of their works, or perhaps they calculated them in common with other rustic works, whose thickness is as four to six.

343. The width commonly allowed to bridges of a moderate size is about thirty feet; but in larger ones, near great towns or cities, thirty feet are allowed clear for horses and carriages, besides a raised footway on each side for foot passengers, of six or nine feet each, raised about a foot above the carriage road; the parapet walls on each side should be about eighteen inches in thickness, and four feet in height. The line of pavement is sometimes designated on the sides next the water by a cornice either plain or decorated with blocks or cantalivers. Sometimes balustrades of stone or iron are placed on a blocking course instead of a plain parapet, as upon most of the stone bridges over the Thames, and that at Edinburgh, where the bridge is of great extent, and built upon a magnificent scale of decoration.

344. The ends of bridges generally open from the middle of the two large arches with two wings, making an angle of forty-five degrees with the rest, in order to make their entrance more free. These wings are supported by a continuation of the arches; that which is immediately under each wing being smaller than the rest. But the wings or entrances to bridges are often supported by the solid abutment alone.

Sect. II.—Of Laying the Foundation of Piers and conducting the Work.

345. The most proper season for laying the foundations of a bridge is in autumn, when the waters are lowest, and when the weather is suitable for aquatic architecture. The ancients used several methods to obtain a durable foundation for their stone bridges. Some of these it will be proper to allude to, that the reader may form his own judgment, by comparing the ancient with the modern practice.

346. Alberti, one of the earliest of those modern architects who have written upon the architecture of bridges, gives the following directions for laying the foundation of a pier:—'First raise an enclosure to keep off the water by driving a double row of stakes or piles very close and thick set, with their heads above the top of the water like a trench. Then put hurdles within this double row of stakes. Close that side of the row which is next to the intended pier, and fill up the hollow between the two rows with rushes and mud, ramming them together so hard that no water can possibly get through. Then whatever is found within this enclosure, whether it be water, mud, sand, or whatever else is a hindrance to the works, is to be thrown out, and the earth dug down till you arrive at a solid foundation. Or, if you find it necessary, make a foundation of wooden piles, burnt at the ends, and driven in as close together as possible. And here I have observed, that the best architects used to make a continued foundation of the whole length of the bridge, and not merely under each pier; and this they did, not by shutting up the whole river at once by a single enclosure, but by first excluding one part, then another, and so by joining the whole together by degrees; for it would be impossible to withstand and repel the whole force of the water at once. We must therefore, while we are at work at one part, leave another part open for a passage for the stream. You may leave these passages either in the channel itself, or if you think it more convenient, you may frame wooden dams or hanging channels, by which the superfluous water may run off; but, if you find the expense of a continued foundation for the whole bridge too great, you may only make a separate foundation for every separate pier, in the form of a ship, with one angle in the stern and another in the head, lying directly even with the current of the stream, that the force of the water may be broken by the angles. We are to remember that the water is much more dangerous to the stern than to the head of the pier.'

347. Palladio, who is the next writer, says 'To lay the foundations of pilasters,' by which he means the piers of a bridge, 'if the bed of the river be stone or gravel-stone, you have the foundation without any trouble; but, in case the bottom be quicksand or gravel, you must dig therein till you come to solid or firm ground; or if that should be found too laborious, or impracticable, you must dig moderately deep in the sand or gravel, and then you must drive in oaken piles that will reach the solid or firm ground, with the iron by which their points are to be armed. A part only of the bed of the river must be enclosed from the water, and then we are to build there; that the other part being left open, the water may have its free current, and so go on from part to part.'

348. Scamozzi proposes three different methods, namely: I. By driving a double row of piles and filling in between chalk or some close materials, and afterwards pumping out the water, and then driving other piles within them to form the foundation of the piers. This being done, a platform of oak plank is to be framed and laid upon these piles, on which the stone work of the pier is to rest.

349. II. His second scheme is, after having sounded the river and levelled its bed, to make a strong frame, or grillage, as he calls it, of oak, which is to be buoyed by boats, and, having a thick course of two stones laid upon it, well cramped together with iron and jointed with strong tarrass, he directs it to be let down gently to its place in the bed of the river.

350. III. After having turned the course of the river on one side, by means of fences or channels sunk in the bed of the river, he made a dam with piles entirely across the river, sufficiently wide to build the piers in; and when he had by digging obtained a proper foundation, he proceeded to build all his piers together; and having raised them above low-water mark he again turned the channel of the river into its former place.

351. The various circumstances of different rivers seem evidently to have given occasion to these three methods in the course of Scamozzi's practice; not that he considered any of them alike practicable in all cases. His first method, we presume, was applied in those cases where the river was deep and destitute of a good natural bed. His second was probably adopted when a river was moderately deep, but of a natural good foundation in its bed capable of supporting a heavy pier, founded on a strong frame of oak immediately let down upon it, without the greater trouble and expense of piling, damming, and pumping out of the water. His third method we suppose he meant to apply to the instances of fordable, shallow, and narrow rivers, canals, or brooks, &c. where there was a suitable place for turning the course of the water either by a wooden fence placed in a diagonal or sloping direction across the river, or, when the ground on one side of the river forming a peninsula, or some form nearly approaching to it, it was not difficult to turn off the stream on one side by digging through the isthmus or neck of land, and equally easy to bring it back again.

352. Such was the situation of Trajan's magnificent bridge over the Danube; of which Dio Cassius gives the following account: 'Trajan built a bridge of stone over the Danube, which in truth one cannot sufficiently admire; for though all the works of Trajan are very magnificent, yet this far exceeds all the others; the piers were ten in number, built of square stone; each of them 150 feet high above the foundation, sixty feet in breadth, and distant from one another 170 feet. Though the expense of this work must have been exceedingly great, yet it becomes more extraordinary by the river being rapid, and its bottom of a soft nature: where the bridge was built was the narrowest part of the river thereabout, for in most other parts it is double or treble the breadth, and although on this account it became so much the deeper, and the stream more rapid, yet no other place was so suitable for this undertaking. The arches were afterwards demolished by Hadrian; but the piers are still remaining, which seem, as it were, to testify that there is nothing which human ingenuity is not able to accomplish.' The whole length of this bridge was 1590 yards. Some authors add that it was built in one summer, and that Apollodorus of Damascus was the architect, who left behind him a description of this great work.

353. Most of the bridges in France have been built on the principles of Scamozzi's first method; namely, by driving oak piles and keeping off the water. This enclosure the French architects call a batterd eau, and the English a coffer-dam.

354. The piers of Westminster bridge, built by a Swiss architect and engineer of the name of Labelye, were founded on an improved kind of coffer-dam, well suited to the necessities of the case. This machine was a kind of pontoon or floated coffer-dam, called a caisson, that was rendered capable of rising again after being sunk to the bed of the river, with two or three of the first courses of stones, laid systematically in it for the foundation of the pier. The bed of the Thames at Westminster being of the best kind, the architect had little more to do than to level it; for previous to this operation they had driven in large piles all around, about five feet in the clear, larger than the dimensions of the caisson or floating coffer-dam. These piles served both as a defence to the coffer, and to secure them in their places when sunk.

355. Having laid the first course of stones on the bottom of the caisson, and floated it exactly over the proper place, it was sunk by opening a sluice made for the purpose in the bottom of the machine, to emit the water. During about two hours before low water, the pumps were employed to draw off the fluid again, the sluice being closed, by which means the vessel with its contents was again raised to the surface for the purpose of affording the workmen an opportunity of correcting such uneven parts of the foundation as they might have observed in their experiment. To the first course they now added two more, cramping each stone together, and filling every joint with tarrass mortar; and, after

having so done, they again opened the sluice and sunk the machine, which deposited the stone-work in the manner just related. By this means they soon brought the masonry to within two feet of low-water mark, and by the succeeding tide were enabled to get above it. The sides of the caisson were so contrived, that by relieving a number of iron wedges, they detached themselves from the bottom, and were at liberty to be used again for another pier, by being again fixed to a new bottom. It should be observed, that when the tide was at the highest the caisson was about six feet under the surface of the water; but being loaded with three courses of stones, and well secured by ropes fastened to the piles, it remained unmoved by the highest and most rapid tide.

356. In this place, it may be natural to inquire, why the caissons were not made sufficiently deep to exclude the water at its greatest height? The answer is easy, when the circumstances are known; for if it be considered that the water at its full height rose sixteen feet, and that the bed of the river where the pier stood was sunk about six feet, a caisson or coffer of twenty-two feet in height would have been necessary; which height would have rendered the machine almost unmanageable; and as they had a sluice in the side of the caisson just on a level with low-water mark, by which all the superfluous water was easily got rid of, it was evidently unnecessary to have the machine higher than sixteen feet. The circumstance of the caisson being so much under water, far from impeding, rather facilitated, the execution of the work; for all the water above the edges of the caisson cleared itself with greater facility than that within, which passed through the sluice. As for the remaining water below the sluice, it was carried off by a number of chain pumps, so that the workmen were enabled to bring up the masonry of the pier above water with much facility. Thus was every pier raised above low-water mark; and in the course of seven years the whole bridge was completed.

357. Since that period, some of the arches of this fine bridge have exhibited symptoms of injury and decay; and a method of repairing them and of reducing the enormous weight of the stone work, by means of spandrel walls on the back of the damaged arches, was suggested a few years since, by a skilful architect, who calculated that there are not less than five hundred tons of not merely superfluous, but absolutely injurious, weight upon them. Labelye, its ingenious architect, said of this bridge that, among other qualities, it contained nearly double the quantity of stone which is in St. Paul's Cathedral.

358. The foundation of Essex bridge, over the Liffey, in Dublin, was laid in 1753, in a very deep and rapid stream, by Mr. Semple, who adopted the following method, as related in a journal kept and published by himself: Round the place where the pier was intended to be built, the workmen drove, at about thirty inches distance from each other both ways, two rows of strong piles, which were left at the height of low-water mark. These piles were lined with planks, within which they rammed a quantity of clay, and thus formed the external wall of the coffer-dam. Within this wall, and at about the same distance, they drove in a row of piles dove-tailed at their edges so as to receive each other, and which formed the extremities of the plan of the piers at the level of the bed of the river. After having dug to a fine stratum of sand, about four feet lower, within these were driven a great number of oaken piles, as deep as they could possibly be made to penetrate. They next filled up the vacuities or intervals of these piles; and, in order to produce a solid and petrified foundation, mortar or cement of a peculiar quality made up of roach lime, and sharp gravel, was employed; and with this the workmen began to lay the first course, ramming in large flat stones to about a foot thick. On this first course they laid a plentiful coat of dry lime and gravel of the same quality, on which they again laid stones, and then proceeded to lay mortar as at first, and continued to pursue the same processes alternately till they came to a level with the piles. Fastened down to the ends of these piles were laid three beams, stretching the whole length of the pier from sterling to sterling, the intervals being filled up with masonry. On this platform, which was four feet six inches under low-water mark, they began to lay the first course of stones for the pier, cramped together and jointed with tarrass as usual, and went forward till they brought up the work to a level with the water at ebb tide.

359. About the year 1765 the foundation of a stone bridge across the river Tees at Stockton was laid by Mr. Shout, an eminent practical bridge-builder of his day; and we shall here mention those few particulars in which his method differed from the preceding: The workmen began with first making very strong coffers of solid fir timber about ten feet square, which they piled, jointed, and secured one to the other till they had gained a sufficient height to exclude the water at its highest tide. The joints of these timbers were then caulked in the same manner as ships; when, launching them without any bottoms, they fixed them down to their respective stations in the river. On the outside and inside they drove a number of piles, which they boarded and rammed with clay, to prevent the water from oozing in at the bottom of the coffers. This was indeed their greatest difficulty; for owing to quicksands, and other loose strata through which the water sprang in, the labor of digging to the proper kind of foundation was immense. The chain pumps were plied incessantly; and by a resolute perseverance the work, which at some periods seemed to bid defiance to human industry and skill, was at length brought above low-water mark; and the completion of the whole of this difficult undertaking occupied a space of time nearly equal to that of Westminster bridge. The bridge is neat and plain, and continues a proof of the stability of its foundation.

360. In some cases, where there is a great depth of water, and the bed of the river is tolerably level, or where it can be made so by any contrivance, a very strong frame of timber about four times as large as the base of the piers may be lowered down, with large stones fixed upon it, round the edges, to make it sink. After fixing it

to a perfect level, piles must be driven round it to keep it in its place; and then the foundation may be laid in coffers as before, which are to be kept steady by means of ropes tied to the piles.

361. This method of constructing the piers of bridges in deep water has been frequently adopted in Russia; and though the bed of the river should happen not to be very solid, yet such a grating of timber, when once well settled with the weight of the pier upon it, will be eventually as firm as if piles had been driven under the foundations. But to prevent the water from undermining the footings, and to secure the base of the pier against all accidents, a row of dove-tailed piles should be driven quite round the grating. This precaution being taken, the foundation will be as secure as any that can be made.

362. The French architectural engineers make use of another method of constructing a foundation of masonry under water; which is, to drive a row of piles round the intended site, nearer to, or farther from, each other, according as the water is deeper or more shallow. These piles being strongly bound together in several places, with horizontal tie-beams, serve to support a row of dove-tailed piles driven within them. When this is done, and all the works are well secured according to situation and circumstances, they dig the foundation by means of a machine with scoops, made for the purpose, until they come to a solid bed of gravel or clay; or, if the bed of the river be of a soft consistence to a great depth, it is excavated only to about six feet deep, and a grating of timber is laid upon it, which is to be well secured with piles driven into the opposite corners of each square, without regard whether they exceed the upper surface of the grating much, or not.

363. When the foundation is thus prepared, they make a kind of mortar which they call beton, consisting of twelve parts of pozzuolano or Dutch tarrass, six of good sand, nine of unslacked lime, the best that can be procured, thirteen of stone splinters not exceeding the size of an egg, and three parts tile-dust, cinders, or scales of iron out of a forge. These ingredients being well worked together, must be left standing for about twenty-four hours, or till the mass becomes so hard as not to be separated without a pick-axe.

364. They then throw into the coffer a bed of rubble stone, not very large, which they spread all over the bottom, as nearly level as they can; a box is next sunk full of this hard mortar, broken into pieces, till it comes within a short distance of the bottom. This box is so contrived as to be overset or turned upside down at any depth; which being done, the pieces of mortar soften, and so fill up the interstices between the stones. By these means they sink as much of it as will form a bed of about twelve inches deep all over; they then throw in another bed of stone, and so continue alternately throwing a bed of mortar, and one of stone, till the work approaches the surface of the water, where it is levelled, when the work is finished with stones in the usual manner. Belidor says, in the second part of his Architecture Hydraulique, vol. ii. p. 188, that M. Mullet de Montville having filled a coffer, containing twenty-seven cubic feet with masonry made of this mortar and rubble stone, he sunk it into the sea, where it was left for two months, and when it was taken out again, the cement was harder than stone itself.

Sect. III. Of Wooden Bridges.

365. Wooden bridges may be constructed by various methods, so as to answer most of the purposes of stone bridges, and even to last a considerable time. See plate X.

366. The invention of wooden bridges was certainly prior to those of stone. Two or three different kinds of them are described by Palladio, after the manner of the ancients. Some of these present one continued frame of wood, composed of a number of parts, and connected together by lapped joints and iron bolts, extending quite across the river, without any pile to support them, depending entirely on the trussed parapets, and on the manner of fixing these frames on the stone abutments. Palladio built one at Bassano, about 200 feet long, by twenty-six broad, which he divided into five apertures, supported and framed like that represented in the plate, which was partly taken from his.

367. The principal and most essential points to be considered in the architecture of timber bridges, are three: first, to season and prepare the wood so as to make it lasting; second, to construct and connect the various parts together so as to make it firm and convenient; and thirdly, to lay a proper and durable pavement on the top or roadway.

368. The following particulars should be observed and attended to, in seasoning the timber. The sudden decay of fir-timber is owing to the sappy nature of its exterior surface, which is by no means capable of being remedied by any immediate application of paint, previous to its being seasoned. On the contrary, it has been proved, that such an application is actually injurious, since it hinders the free admission of air and heat, which would have the property of extracting that sappy quality which so much contributes to decay and rottenness. A consequence of this practice, is, that the sap strikes inwardly and makes its way to the heart of the timber, the substance of which is presently contaminated and destroyed.

369. As a means of preventing this evil, some have the timber dried or scorched over a flaming fire, turning it about till every side acquires a sort of crusty surface: in doing which it necessarily follows that the external moisture is dissipated. After this process a mixture of pitch and tar, sprinkled with sand and powdered shells, may be advantageously applied to the parts under water. Those more in sight, after being well scorched, and while the timber is hot, should be rubbed over with linseed oil, mixed with a little tar. This will strike deeply into the grain of the wood, and will soon harden so as to receive as many coats of paint as may be necessary. It has been found that fir-timber thus prepared is nearly equal to oak for durability.

370. With respect to the top of the bridge, and the formation of the pavement, the joints

that lie on the beams at *a*, should be nine inches square in scantling, and laid at about eighteen inches apart, projecting out beyond the beam, and forming at the same time a kind of modillion. Upon these joints, six-inch planks should be laid, and brought forward so as to project before the ends of the joints, serving as a corona to the modillion, which, with the beam on which they rest, will form something like an entablature to the whole bridge.

371. The floor or bottom part of the roadway of the bridge should be first covered with pitch and tar, and then with common slates; afterwards with one or two courses of bricks, laid in the best mortar, and lastly finished with the common paving work.

Sect. IV.—Of Harbours.

372. The first consideration in the construction of harbours is the situation; which may be some large creek or basin, in or near to the place where the harbour is intended to be made, as at the entrance of a large river, or near to the sea: for a harbour should never be entirely excavated out of dry land, unless upon some extraordinary occasion, where it is impossible to do otherwise, and yet a harbour is absolutely necessary.

373. When a proper situation is found, before it is irrevocably fixed upon, it should be considered whether ships can lie there safely in stormy weather, especially when those winds blow which are most dangerous upon the coast: whether there be any hills, rising ground, or high buildings, that will cover it. In such cases, the situation is very proper; but, if there be nothing already that will protect the ships, it must be observed whether any break-water or other covering can be made at a moderate expense; otherwise it would be useless to construct a harbour there.

374. The next thing to be considered is, whether there be a sufficient depth of water for large vessels to enter with safety, and lie there at anchor without touching the ground; and if not, whether the entrance and interior might not be deepened at a moderate expense; or, in case a sufficient depth of water is not to be obtained for large ships, whether the harbour might not be useful for small merchantmen, or packets; for such a one is often of great utility, when situate upon a coast much frequented by small coasting vessels.

375. The form of the harbour must be determined in such a manner, that the ships which come in when it is stormy weather, may be safe, and so as there may be sufficient room for as many as pass that way: the depths of water where the piers are to be erected must be taken at every ten, fifteen, or twenty feet distance, and marked upon piles driven at proper places, in order that the workmen may be directed in laying the foundation.

376. It should next be considered what description of materials is to be used, whether stone, brick, or timber. When stone can be had at a moderate price, it ought to be preferred, because the work will be much stronger, more lasting, and need fewer repairs, than if constructed with any other materials. But if stone be scarce, and the expense becomes greater than is allowed for building the harbour, the foundation may be made of stone as high as low-water mark, and the rest finished with brick. If this manner of building should still be too expensive, timber must be used; that is, piles driven as close as may be found necessary; which, being fastened together by cross-bars, and covered with strong oak planks, form a kind of coffer, which is to be filled with various species of stones, chalk, and shingle.

377. In preparing and constructing the foundation, different depths of water, and various soils, require different and peculiar modes of treatment. When the water is very deep, the best method is to throw in a great variety of stones at random, so as to form a much larger base than would be required upon dry land. This should be continued till it rises to within three or four feet of the surface of the water, where the stones are then to be laid in a regular manner, till the foundation is raised above the water. A great weight of large blocks of stones should next be laid upon it, and left to stand during the winter to settle, as well as to see whether it be firm, and capable of resisting the action of the winds and waves. After which, the superstructure may be finished with large blocks of stone, laid and faced in the usual manner.

378. As this method consumes a great quantity of material, it can only be adopted in places where stone is abundant. On the coast of Ireland and some parts of Devonshire, where granite and marble abound, it is practised with great success. In such manner is the Asylum harbour of Kingstown (Dunleary), in the Bay of Dublin, now being constructed; and in such manner was the great Breakwater at Plymouth executed. Another mode, where stone is not so abundant, is as follows: namely, a coffer is made with dove-tailed piles of about ninety feet in length, and as wide as the thickness of the foundation is to be; then the ground is dug and levelled, and the wall is built of the best mortar. When the mortar is well set and tolerably dry, the piles at the end of the wall are to be drawn out, the side rows to be continued to about ninety or a hundred feet further, and the end enclosed; then the foundation is to be cleared, and the stones laid as directed before.

379. But it must be observed, that the end of the foundation which is finished, is to be worked in toothings or offsets, and left rough, that the part next it may be incorporated and bonded with it in a proper manner; but if it be not very dry, it will incline that way of itself, and bind with the mortar that is thrown in next to it; and this method is to be continued till the whole pier is completely finished. It must likewise be observed, that the piers are not to be made of one continued solid wall; because, in deep water, it would be too expensive; for which reason, two walls are in such instances to be built parallel to each other, and the interval between them is to be filled in with shingle, chalk, and stone. As this kind of walls are in danger of bulging out or oversetting by the rough filling in, added to the great weights often laid upon the pier, they are to be tied or bonded together

by cross-walls at every thirty or forty yards distance, by which means they support each other in a firm and strong manner.

380. Where there is abundance of stone, piles may be driven in as deep as they will go, at about two or three feet apart; and, when the foundation is sunk or levelled, large stones are to be lowered down, which will bed themselves; but care must be taken to lay them close and bonded, so as to have no two joints over each other; and when the wall is built up to within reach, the stones should be cramped or dove-tailed together.

381. Another method sometimes practised is, to build on coffers or caissons much in the same manner as has been described in building the piers of Westminster-bridge (see para. 354, 355): but as, in this case, the ends of the coffers must be left in the wall, which prevents their joining so well as to be water-tight, the water that penetrates thereby will enter the rubble filling in, and occasion the wall to burst and to tumble down. Another inconvenience arising from this method of construction is, that as there are but few places without worms, which will destroy wood wherever they can find it; by these means the water is let into the pier, and consequently renders the work liable to the same accident as has been mentioned above.

382. The best method to obviate these inconveniences, is to take the timber away, and joggle the ends of the walls together with large stone, pouring tarrass mortar into the joints. When this is done the water between the two walls is to be pumped out, and the void space filled up with stone, chalk, and shingle, as before described. Or if these joggles cannot be made water-tight, some dove-tailed piles should be driven in as close to the wall as possible, and a strong sail-cloth put on the outside of them, which, when the water is pumped out, will stick so close to the piles and wall, that no fluid can enter. This method is often adopted in Russia.

383. The thickness of a pier ought to be both such as may enable it to resist the shock of the waves in strong weather, and also of a sufficient breadth above, that ships may be laden or unladen whenever it is thought necessary. Now, because the specific gravity of sea water is about half that of fresh, and as 2 to 5 in comparison with stone; and since the pressure of stagnated water against any surface is equal to the weight of a prism of water whose altitude is the length of that surface, and whose base is a right angled isosceles triangle, each of the equal sides being equal to the depth of the water; therefore a pier built with bricks, whose thickness is equal to the depth of the water, will weigh about four times as much as the pressure of the water against it; and one of stone of the same breadth, about six times and a quarter as much. Now this is not the force to be considered, since this pressure is the same within as without the pier; but it is that force with which the waves strike against the piers, and that depends on the weight and velocity of the waves, which cannot be determined with much precision; because they vary according to the different depths of water, the distance from the shore, and according to the tides, winds, and other accidental causes. Consequently the proper thickness of the piers cannot be determined by any other means than those deduced from practice and experience.

384. Practitioners suppose that if the thickness of a pier be equal to the depth of the water, it is sufficient; but for a greater security they allow two, three, and four feet more. This proportion would probably do, if the piers were to be built with solid stones cramped together; but as this is hardly ever the case, and, on the contrary, as the inside is mostly filled up with shingle, chalk, rubble, and other loose materials, the rule is not to be depended upon: besides it makes the space above too narrow for loading and unloading of ships, unless in a great depth of water; so that it does not appear that this method of calculation can be relied upon, except in a very few cases where the water has but little motion.

385. No other materials should be used, when stone can be obtained, because the blocks being always of a larger bulk than brick, they will better resist the waves by their own weight, till the cement is grown hard; after this is effected, brick will afford a better resistance against the action of sea water than soft stone.

386. The wall should be built with tarrass mortar, or good cement, from the bottom to the height of low-water mark, and the rest finished with cinder or tile dust mortar, which has been found by experience to be sufficiently good for those parts which are wet and dry alternately. The upper part of the pier should be paved with flat hewn stones laid in strong mortar, in order to prevent any water from penetrating it. Iron rings should also be fixed at proper distances, to fasten the ships to, and prevent them from striking against the pier when agitated by the waves.

387. Wooden fenders or piles should be driven on the inside, close to the wall, and cramped to it by iron, to prevent the ships from touching them, or from being worn by their continual motion. Where the sea breaks against the piers with great violence, breakers, or break-waters, should be constructed at proper distances; that is, two rows of piles are to be driven nearly at right angles with the piers for the length of about twelve or fifteen feet, and at about eight or ten feet distance from each other; and another should join the two former. These piles being covered with planks, and the inside filled with shingle and rubble stones, or boulders, then the top is to be paved with stones of about a foot in length, set lengthways, to prevent the waves from tearing them up. This precaution is absolutely necessary where the water rushes in very strongly.

388. The principal works on architecture that are most useful to the student are the following:—An Enquiry into the Principles of Beauty in Grecian Architecture, by the Earl of Aberdeen, 8vo. Lond. 1822. Robert and James Adam's Works in Architecture, fol. 3 vols. Lond. 1764 and 1822. Robert Adam's Ruins of the Palace of Dioclesian at Spalatro, fol. Lond. 1764. Robert Adam's Buildings in Scotland, fol. 1764; Architectural Remains in Rome, Pola, and Naples, from drawings by Clerisseau, under the

direction of Robert Adam, esq. F. R. S. Edm. Aikin's Essay on the Doric Order of Architecture, fol. Lond. 1816; Designs for Villas, by the same, 4to. Lond. 1817. L. B. Alberti's Architecture, by J. Leoni, Italian and English, fol. Lond. W. Adam's Vitruvius Scotticus. H. Aldrich's Elements of Civil Architecture, English and Latin, 8vo. Oxford, 1789. T. Allason's Picturesque Views of the Antiquities of Pola, fol. Lond. 1819; Ancient Relics, or Delineations of Monastic Castellated, and Domestic Architecture, 2 vols. 8vo. Lond. 1812; Antiche d'Ercolano, fol. 1765; Antiquities of Ionia, published by the Society of Dilettanti, fol. Lond. 1769 and 1817; the same, with the Additions of Sir William Gell, Mr. Gandy, and Mr. Bedford, fol. Lond. 1821. Architectural Ornaments, by Aglio, large 4to. Lond. 1820. The Antiquities of Athens, by Stuart and Revett, 4 vols. fol. Lond. 1769. W. Atkinson's Views of Picturesque Cottages, with plans, 4to. Lond. 1805. Atwood's Theory of Arches, 4to. Lond.; The unedited Antiquities of Attica, comprising the Architectural Remains of Eleusis, Ramnus, Sunium, and Thoricus, by the Society of Dilettanti, fol. Lond. 1817. Illustrations and History of most of the English Cathedrals, by J. Britton, F. S. A., now in progress, 1824; the Architectural Antiquities of Great Britain, by the same, 4 vols. 4to. Lond. 1807, 14; Fine Arts of the English School, by the same, including Plans, Elevations, and Section of the Cathedral Church of St. Paul, London, by James Elmes, Architect, M. R. I. A.; Historical and Architectural Essay relating to Redcliffe Church, Bristol, by the same, and Chas. Wild; Chronological and Historical Illustrations of the Ancient Architecture of Great Britain, by the same, 4to. Lond. 1818, 20; Account of Corsham House, Wilts, by the same, 8vo. Lond. 1806. Buckler's, J. C. English Cathedrals, 8vo. The Earl of Burlington's Designs of Palladio, with the Details, fol. Lond. 1730. C. A. Busby's Series of Designs for Villas; Plate of the celebrated Wooden Bridge across the Delaware at Trenton, Lond. 1822. C. Campbell's Vitruvius Britannicus, 4 vols. fol. Lond. 1715, 27, 31, 67, 71. Woolf and Gandon's Supplement to the same work, fol. Lond. 1715, 17, 71. C. Cameron's Baths of the Romans explained and illustrated, with the Restorations of Palladio, corrected and improved, fol. Lond. 1772. J. Carter's Ancient Architecture of England, 2 vols. fol. Lond. 1795; Account of the Cathedral Church of Exeter, by the same; Account of the Cathedral Church of Durham, by the same. R. Castell's Villas of the Ancients illustrated, fol. 1728. Series of the Cathedrals of England, published by the Antiquarian Society of London, elephant fol., consisting of the Abbey Church of St. Alban's, 1810; the Cathedral Churches of Exeter, 1797, of Durham, 1801, of Gloucester, 1809; the Abbey Church of Bath, 1798; the Collegiate Chapel of St. Stephen. Westminster, 1795; and a Supplement to the same by Sir H. C. Englefield, 1811. Sir William Chambers's Treatise on Civil Architecture, fol. Lond. 1768; a New Edition of the same Work, with new Plates, Notes, and an Examination of Grecian Architecture, by Joseph Gwilt, F. S. A. 1824; as also an edition with the old plates, and an additional Chapter on Grecian Architecture, by J. B. Papworth; Buildings and Views in Kew Gardens; Designs for Chinese Buildings; Dissertation on Oriental Gardening, by the same. R. Chandler's Travels in Asia Minor and Greece; or an Account of a Tour made at the Expense of the Society of Dilettanti, 2 vols. 4to. Lond. 1817. Dugdale's St. Paul's, fol. Lond.; and Monasticon, fol. The Earl of Elgin's Pursuits in Greece, 8vo. Lond. 1811. E. Edwards's Practical Treatise on Perspective, 4to. Lond. 1806. James Elmes's, M. R. I. A. Lectures on Architecture, comprising the History of the Art from the earliest times to the present day, delivered at the Surrey and Russell Institutions of London, and the Philosophical Institution of Birmingham; dedicated, by permission, to his Majesty George IV. Lond. 8vo. 1821 and 1823; Life of Sir Christopher Wren, with an Account of his Works, by the same, 4to. Lond. 1823; Hints for the Construction of Prisons, published under the sanction of the Select Committee of the House of Commons, 4to. Lond. 1819, by the same; A Practical Treatise on the Law of Dilapidations, &c. 8vo. Lond. 1820 and 1823, by the same; Plans, Elevations, and Section of St. Paul's Cathedral, by the same, 4to. Lond. 1813. Essay on Architecture, 8vo. Lond. 1755. Essays on Gothic Architecture, by the Rev. T. Warton, the Rev. J. Bentham, Captain Grose, and the Rev. J. Milner, 8vo. Lond 1808. Essays of the London Architectural Society, 2 vols. 8vo. 1808, 1810. J. Essex on Stone Buildings in England. Observations on Lincoln Cathedral, on Round Churches, &c. 4to. J. Gandy's, A. R. A. Rural Architect, consisting of various Designs for Country Buildings, Lond. 1806. Sir William Gell's and J. P. Gandy's Pompeiana, 8vo. Lond. 1821. J. Gibbs's Architecture, containing Designs for Buildings and Ornaments, fol. Lond. 1728, 1739; Description of the Radcliffe Library, Oxford, by the same, fol. Lond. 1747; Rules for Drawing the several Parts of Architecture, fol. Lond. 1732. L. N. Cottingham's Working Drawings for Gothic Ornaments, atlas fol. Lond. 1822; Working Drawings for Grecian, Etruscan, and Roman Ornaments, by the same, fol. Lond. 1822. J. Gwilt's, F. S. A. Notitia Architectonica Italiana, or concise Notices of the Buildings and Architects of Italy, 8vo. of Lond. 1818: a Treatise on the Equilibrium of Arches and their Abutments, by the same, 8vo. Lond. 1821; Sciography, or Examples of Shadows, with Rules for their Projection, intended for the use of Architectural Draughtsmen and other Artists, by the same, 8vo Lond. 1824. J. E. Hawkins's History of the Origin and Establishment of Gothic Architecture, royal 8vo. 1813. Thomas Hope's Designs for Household Furniture and Interior Decoration, fol. 1807. T. S. Hughe's Travels in Sicily, Greece, and Albania, 2 vols. 4to. Lond. 1820. Dr. Hutton's Principles of Bridges, 8vo. Lond. 1801. Inigo Jones's Designs, consisting of Plans and Elevations for Public and Private Buildings, by Wm. Kent, 2 vols. large fol. Lond. 1727. Inigo Jones and William Kent's Designs, fol. Lond. 1744 J. C. Loudon's Observations on laying out Farms, Rural Improvements, &c. 4to. Lond. 1812—

J. Murphy's Plans, Elevations, Sections, and Views of the Church of Batalha, fol. Lond. 1795; Arabian Antiquities of Spain, by the same, elephant fol. Lond. See ALHAMBRA. F. Nash's Series of Views, interior and exterior, of the Collegiate Chapel of St. George at Windsor, elephant fol. Lond. 1805. J. P. Neale's History and Antiquities of the Abbey Church of St. Peter, Westminster, 4to. Lond. 1818. P. Nicholson's Architectural Dictionary, 4to. Lond. 1821; Principles of Architecture, by the same, 3 vols. 8vo. Lond. 1809; Carpenter's and Joiner's Assistant, by the same, 4to. Lond. 1815; Carpenter's New Guide, by the same, 4to. Lond. 1819; Student's Instructor in Drawing and Working the Five Orders of Architecture, by the same, 8vo. Lond.; Treatise on the Construction of Stairs and Hand Rails, by the same, 4to. Lond. 1820; Rudiments of Practical Perspective, by the same, 8vo. Lond. 1822. Andrea Palladio, quattro libri, dell' Architettura, fol. Venice, 1570, 1616: First Book of Architecture, by the same, in English, French, and Italian, by G. Leoni, fol. Lond. 1715; Architecture, by the same, translated by J. Ware, fol. Lond.; First Book of Architecture, by the same, translated by G. Richards, 4to. Lond. 1733. John B. Papworth, On the Dry Rot in Buildings. T. Rickman's Essay on Gothic Architecture, 8vo. Lond. 1819. S. Riou's Grecian Orders of Architecture delineated and explained from the Architectural Antiquities of Athens, fol. Lond. 1768. T. Smeaton's Narrative of the Building of the Eddystone Light-house, fol. Lond. 1813. J. Soane, R. A. Sketches in Architecture, Plans and Elevations of Cottage Villas, and other useful Buildings, fol. Lond. 1798; Sketches for Cottages, Villas, &c. by the same, fol. Lond.; Plans, Elevations, and Sections of Buildings executed in the Counties of Norfolk, Suffolk, Yorkshire, Wiltshire, &c. &c. by the same, fol. Lond. The Civil Architecture of Vitruvius, comprising those books of the author which relate to the public and private edifices of the ancients, translated by W. Wilkins, A. R. A. Vitruvius, by W. Newton, 2 vols. fol. Lewis Vulliamy, the Bridge of the Santissima Trinità over the Arno at Florence, measured, drawn, and accompanied by explanatory Remarks, fol. Lond. 1822. J. Ware's Complete Body of Architecture, fol. Lond. 1768. Samuel Ware, Treatise on the Properties of Arches and their Abutment Piers, 8vo. Lond. 1809; Tracts on Vaults and Bridges; on the taking down and re-building London Bridge, &c.; Treatise on Theatres, by the same, 8vo. Lond. 1822. J. Whitaker's Ancient Cathedral of Cornwall, historically surveyed, 2 vols. 4to. Lond. 1804. William Wilkins, M.A. and A.R.A. Antiquities of Magna Græcia, fol. Lond. 1807; Translation of Vitruvius, mentioned before, by the same; Atheniensia, or Remarks on the Topography and Buildings of Athens, by the same, 8vo. Lond. 1816. Woolnoth's Canterbury Cathedral. Winckleman, Recueil de Lettres de, contenant Découvertes d' Herculaneum, Lettre de M. H. Fuseli, Remarques sur l'Architecture, &c. 3 tom. 8vo. Amsterdam, 1781; Remarques sur l'Architecture des Anciens, by the same, 8vo. Paris, 1788. S. Weston's Manual of detached Remarks on the Buildings, &c. of Rome, 12mo. Lond. 1819. G. D. Whittington's Historical Survey of the Ecclesiastical Antiquities of France, 8vo. Lond. 1809. C. Wild's Cathedrals of Lincoln, Worcester, &c. fol. Lond. 1822, 1823. Wiebekin on Bridges, Draining, &c. 4 vols. 4to. the same, des Ponts à Arches de Charpente, 4to. Willis's Cathedrals, 4to. R. Wood's Ruins of Balbec, fol. Lond. 1767; Ruins of Palmyra, by the same, fol. Lond. 1753. J. Wood's Series of Plans for Cottages, &c. 4to. Lond.

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Architecture, Counterfeit, that which consists of projectures painted black or white, or in different colors, so as to imitate marble. It is also called scene work, in the painting of columns for decorating theatres, &c.

Architecture, in perspective, a kind of building, the parts of which are of various modules, and decrease proportionably to their distance, so that the work may appear longer to the view than it is in reality.

ARCHITRAVE; from *αρχη*, chief, and *trabs*, Lat. a beam; because it is supposed to represent the principal beam in timber buildings: that part of the column, or order of a column, which lies immediately upon the capital, and is the lowest member of the entablature. This member is different in the different orders; and, in building architrave doors and windows, the workman frequently follows his own fancy. The architrave is sometimes called the reason-piece, or master-beam, in timber buildings, as porticoes, cloisters, &c. In chimneys it is called the mantle-piece; and over jambs of doors, and lintels of windows, hyperthyron.

Architrave Doors are those which have an architrave on the jambs, and over the door upon the cap-piece, if straight; or on the arch, if the top be curved.

Architrave Windows, of timber, are commonly an ogee raised out of the solid timber, with a list over it; though sometimes the mouldings are struck, and laid on; and sometimes cut in brick.

ARCHITRICLINUS, in antiquity, the director of a feast. The architriclinus was sometimes called servus tricliniarcha, and by the Greeks *προγευστης*, or fore-taster. Potter takes the architriclinus to signify also the same with the symposiarcha.

ARCHIVAULT, in architecture, the inner contour of a niche, or a band adorned with mouldings, running over the faces of the arch stones, and bearing upon the imposts. It has only a single face in the Tuscan order, two faces crowned in the Doric and Ionic, and the same mouldings as the architrave in the Corinthian and Composite.

AR'CHIVES. The record-office, where the public papers are kept. Sometimes by a common figure applied to the papers themselves. Supposed to be derived from *αρχεια*, public registers. Transmitted to us by means of the Latin of the middle ages, and the Norman French, it is not surprising that it should in some degree deviate from the Gr. *αρχειον* or *αρχεια*, from which it is generally supposed to be derived.

Though we think our words vanish with the breath that utters them, yet they become records in God's court; and are laid up in his *archives*, as witnesses either for or against us. *Gov. of the Tong.*

I shall now only look a little into the Mosaic *archives*, to observe what they furnish us with upon this subject. *Woodward.*

Archives; from arca; a chest wherein the records, charters, and other papers and evidences of a state, house, or community, are preserved. The archives of ancient Rome were in the temple of Saturn; the archives of the court of chancery are in the rolls office.

ARCHIVIST, or Archivista, a keeper of archives. Under the emperors the archivist was an officer of great dignity, held equal to the proconsuls, vested with the quality of a count, styled clarissimus, and exempted from all public offices and taxes. Among the ancient Greeks and Persians the trust was committed to none but men of the first rank; among the Franks the clergy, being the only men of letters, kept the office among themselves. Since the erection of the electoral college the archbishop of Mentz has had the direction of the archives of the empire.

ARCH-MARSHAL, the grand marshal of the empire; a dignity in Germany belonging to the elector of Saxony, who, in that quality, goes immediately before the emperor on public solemnities, bearing a naked sword.

ARCHON; *αρχων*, a commander: one of the chief magistrates of the city and state of the Athenians; they were nine in number.

Archons, in Grecian antiquity, magistrates of Athens, appointed after the death of Codrus, and the abolition of royalty. See Attica. They were chosen from the most illustrious families till

the time of Aristides, who procured a law to be passed, by which it was enacted, that in electing these magistrates less regard should be paid to birth than to merit. The tribunal of the archons was composed of nine officers. The first was properly *archon*; by whose name the year of his administration was distinguished. The title of the second was βασιλευς, or king: that of the third *polemarchos*; from πολεμος, war, and αρχειν, to command: and to these were added six thesmothetæ. These magistrates were obliged to swear before their respective tribes, 1. That they had sprung, both by father and mother for three descents, from citizens of Athens; 2. That they were attached to the worship of Apollo, the tutelar god of their country; 3. That they had been respectfully obedient to their parents; an important and sacred part of their character; from which it was expected they would be faithful servants to their country; 4. That they had served in a military capacity the number of years which the republic required of every citizen: and this qualification gave the state experienced officers; for they were not allowed to quit the army till they were forty years old. Their fortune too, of which they were to inform those who examined them, was a warrant for their fidelity. After the commissioners had made a favorable report of them, they were to swear that they would maintain the laws without taking a bribe, which obligation if they neglected, they engaged to send to Delphi a statue of gold of the weight of their bodies. According to a law of Solon, if an archon was convicted of drunkenness, and dared after that to appear with the ensigns of his office, he was to be punished with death. Such magistrates as the Athenian archons were well entitled to respect. Hence it was eternal infamy to insult them; and Demosthenes observed, that to treat the thesmothetæ with disrespect was to show disrespect to the republic. Another qualification indispensably required of the second officer of this tribunal, the βασιλευς, or king, was, that he had married the daughter of an Athenian citizen, and that he had espoused her a virgin. This was exacted of him, says Demosthenes, because part of his duty was to sacrifice to the gods jointly with his wife, who, instead of appeasing, would have irritated them, if she had not possessed both those honors. The inquiry into the private title of the nine archons was very severe; as they had a right to take a seat in the Areopagus, after they had quitted their office and given an account of their administration. When any obscurity occurred in the laws relative to religion and the worship of the gods, the interpretation was submitted to the tribunal of the archons. Aristotle observed that Solon, whose aim was to make his countrymen happy, and who found their government in his time aristocratical; by the election of the nine archons, who were annual magistrates, tempered their power by establishing the privilege of appealing from them to the people. The archons were the principal officers, not only in civil, but in sacred, matters, and especially in the mysteries of Bacchus. The archons, however, who were surnamed eponymi, were chiefly employed in civil affairs; yet they presided at the great feasts, and held the first rank there. Hence they are sometimes styled priests. After some time the qualifications which were required to be an archon were not strictly observed. Adrian, before he was elected emperor of Rome, was made archon at Athens, though a foreigner; and the same honors were conferred upon Plutarch. The perpetual archons, after the death of Codrus, were Medon, whose office began B. C. 1070, Acastus, 1050; Archippus, 1014; Thersippus, 995; Phorbas, 954; Megacles, 923; Diognetus, 893; Pherecles, 865; Ariphron, 846; Thespius, 826; Agamestor, 799; Æschylus, 778; Alcmæon, 756; after whose death the archons were decennial, the first of whom was Charops, who began 753; Æsimedes, 744; Clidicus, 734; Hippomenes, 724; Leocrates, 714; Apsander, 704; Eryxias, 694; after whom the office became annual, and of these annual archons Creon was the first.

ARCHONS, in modern history, divers officers, both civil and religious, under the Greek emperors. Thus bishops were sometimes called archontes, as well as the lords of the emperor's court.

ARCHONTICI, in church history, a branch of Valentinians, who maintained that the world was not created by God, but by angels called Archontes, or archangels. They also denied the resurrection.

ARCHONTIUM. See ARCHONS.

ARCH-PRIEST, or ARCH-PRESBYTER, was anciently the first person after the bishop; he was seated in the church next after the bishop, and acted as his vicar in his absence. In the sixth century there were found several arch-priests in the same diocese; from which time some will have them called deans. In the ninth century they distinguished two kinds of cures or parishes: the smaller governed by simple priests; and the baptismal churches by arch-priests, who, beside the immediate concern of the cure, had the inspection of the other inferior priests, and gave an account of them to the bishop, who governed the cathedral church in person. There are arch-presbyters still subsisting in the Greek church, vested with most of the functions and privileges of chorepiscopi, or rural deans.

ARCH-PRIOR, a name sometimes given to the grand-master of the order of templars.

ARCHTELIN, a corn measure of Rotterdam, containing three pecks, five quarts, and nearly a pint.

ARCH-TREASURER, the great treasurer of the German empire, and protector of the order of St. John, can raise noblemen and gentlemen to the degree of counts, and also admit as bondmen those that are illegitimately born, and other persons of foreign countries, on their binding themselves to the duties of the electorate and to the payment of a certain tribute. This office was created with the eighth electorate, in favor of the elector Palatine, who had lost his former electorate, which was given to the duke of Bavaria by the emperor Ferdinand II. who took it from Frederick V. elector Palatine after the battle of Prague, where he was defeated in maintaining his election to the crown of Bohemia. The dignity of arch-treasurer was afterwards con-

tested, but was at last settled upon the elector of Hanover; who claimed it in virtue of his descent from Frederic elector Palatine. Accordingly his majesty the king of Great Britain bears the title, which is thus contracted upon coin, S. R. I. A. T. ET E. i. e. Sacri Romani Imperii Archi-Thesaurus et Elector.

ARCHWINNITTY Sea, an inlet of the North Sea, which communicates through Hazard Gulf with Hudson's Bay.

ARCHYTAS of Tarentum, a Pythagorean philosopher, famous for being the master of Plato, Eudoxus, and Philolaus, lived about A. A.C. 408. He was an excellent mathematician and mechanic: he is said to have made a wooden pigeon that could fly, and to be the first that brought mathematics to common uses. Aristotle was indebted to Archytas for his general heads of arrangement, entitled his Ten Categories, and probably for that principal idea in his Ethics, 'that virtue consists in avoiding excesses;' for he taught that every extreme is incompatible with virtue; and he exemplified this doctrine in his life. He asserted that God was the beginning, the supporter, and the end of all things. There are two epistles preserved in Diogenes Laertius, one from Archytas to Plato, and another from Plato to Archytas. He acquired great reputation in his legislative capacity. He likewise commanded the army seven times, and was never defeated; but was at last shipwrecked on the coast of Apulia.

ARCILEUTO, or Archilute, a long and large lute, having its bass strings lengthened after the manner of the theorbo, and each row doubled, either with a little octave or an unison. It is used by the Italians for playing thorough bass.

ARCINELLA, in conchology, a species of chama found in the Atlantic, generally off the American coast.

ARCION, in botany, tussilago, or colt's foot.

ARCIS-SUR-AUBE, a small town of France, seated on the river, and capital of the department of Aube. The population is 2,300; the manufactures are stockings and caps. Long. 4° 14′ E., lat. 48° 33′ N.

ARCIVÆ Aves, in antiquity, birds which gave bad omens, either by their flight, noise, or manner of eating. They were called arcivæ, sometimes also arculæ, quia arcebant ne quid fieret, prevented or forbade things being done.

ARCO, a strong town and castle in the Tyrol, belonging to the house of Austria. It was taken by the French in 1703, and abandoned soon after. It is now included in the Lombardo Venetian kingdom. It stands on the river Sarca, near the northern extremity of the lake Garda, twelve miles south-west of Trent. Long. 11° 12′ E., lat. 46° 0′ N.

ARCONA, a strong town situated on the island of Rugen in the Baltic. It stood on a high promontory, with the east, north, and south sides defended by steep and lofty precipices, and the west by a wall fifty feet high, proportionably thick, and secured by a deep and broad ditch. It was, however, taken in 1168 by Valdemar king of Denmark. One of the conditions imposed by the conqueror was, that the inhabitants should destroy a church which they had erected to St. Vitus, and deliver up the vast treasure belonging to this tutelary saint. Another was that they should pay forty silver yokes for oxen, by way of tribute, and enter as soldiers in the Danish service when called upon.

ARCOS, a strong city of Andalusia in Spain, seated on a high craggy rock, at the bottom of which runs the Guadalete, twenty-eight miles north-east of Cadiz. Its strength lies not only in its situation, but in the works erected for its defence, and it is inaccessible on every side but one. The governor resides in an old castle, from whence there is a delightful prospect, which extends very far into the neighbouring country. It contains two parish churches, seven convents, and a population of 12,000 souls. It is the residence of the vicar-general of the metropolitan of Seville. The surrounding country is very fruitful. Forty miles south of Seville. Long. 55° 5′ W., lat. 36° 40′ N.

ARCOT, a city of Hindostan, the capital of the Carnatic, is situated on the south side of the river Palar, which is here half a mile wide, but contains little water in the dry season. The town is extensive and surrounds a large fort, which is in disrepair. Its chief manufacture is cotton cloths. Arcot is supposed to be named by Ptolemy as the capital of the Soræ, or Soramundalum, from which Coromandel is corruptly derived; but the present town is of modern date. The Mogul armies, after they had captured Gingee, were forced to remove, in consequence of the unhealthy situation, to the plains of Arcot; and this circumstance led to the establishment of the city of Arcot in 1716. Anwanud Deen, nabob of Arcot, having been killed in battle in 1749, the town was taken by Chundasaheb, a candidate for the government, who was supported by the French. In 1751 it was retaken by Lord Clive, then Colonel Clive, with 200 Europeans and 300 sepoys, although the garrison amounted to 1,100 men. The siege in which Colonel Clive afterwards sustained, for fifty days, the attack of the whole army of the French and their allies, though his own force had been reduced nearly one-half, established his military fame. During the war it was again taken possession of by the French candidate for the nabobship; but finally surrendered to Colonel Coote in 1760, after the battle of Wandewash. In 1780 it was besieged by Hyder Ali, who gained possession of it on the 30th of September, after having defeated the British under Colonel Baillie. The town and district are now rapidly recovering from the destructive effects to which they have been exposed, in consequence of having so frequently been the scene of war. Distance from Madras seventy-three miles, from Seringapatam 217. Long. 79° 29′ E., lat 12° 52′ N.

Arcot, a large district of Hindostan. It was formerly an independent state, but its supremacy was transferred by the nabob to the British in 1802. It is now divided into two portions, north and south, and includes Sativaid, Pulicat, Coongoody in the Barramahal, part of the Balaghaut, Cuddalore and Pondicherry. In 1806 this district was in a very miserable state, but it

has since improved. The exports consist chiefly of arrack, pepper, palmirahs, drawn from Ceylon, Travancor, and Prince of Wales' Island. Large supplies of piece goods are exported to the Isle of France, and a small quantity of rum to Ceylon. The imports are betel nut, pepper, benjamin, camphor, sugar, and elephants' teeth; besides which, rice from Bengal, and tobacco from Ceylon, in small quantities, are occasionally received.

ARCTATIO, or ARCTITUDO, a straitness of the intestines, constipated from inflammation: also a preternatural straitness of the uterus.

ARCTIA, in entomology, a genus of insects of the order lepidoptera and family noctua-bombycites of Latreille. It is a subdivision of the Linnæan genus phalæna. The generic character is palpi, scaly; antennæ of the males doubly pectinated; the tongue short, and composed of two distinct filaments. Latreille divides this genus into two sections, the first including those with ciliated antennæ; the second those in which they are truly pectinated. To the first belong the phalæna (bombyx), caja, villica, plantaginis, and others, known to collectors in this country by the name of tiger moths. In the second division are found the phalæna, salicis, chrysorrhæa, &c. Arctia chrysorrhæa is too well known in this country, by the destruction which has in some years been produced by its larva amongst fruit-trees. The eggs are laid in beautiful rings around the stem of the tree, and in the spring the larva makes its appearance. They are gregarious, and form a large web to which they retreat at night and in wet weather; they feed in society, and march with great regularity; and their numbers are sometimes so great as to become a serious calamity. In 1783 they were so destructive in the neighbourhood of London, that subscriptions were opened to employ the poor in cutting off and collecting the webs; and it is asserted, that not less than 80 bushels were collected and burnt in one day in the parish of Clapham.

ARCTIC, in astronomy, an epithet given to the north pole, or the pole raised above our horizon. It is called the arctic pole on account of the constellation of the little bear, in Greek called αρκτος, the last star in the tail whereof points out the north pole.

ARCTIC CIRCLE is a lesser circle of the sphere, parallel to the equator, and 23° 28′ distant from the north pole; from whence its name. This, and its opposite the antarctic, are called the two polar circles; and may be conceived to be described by the motion of the poles of the ecliptic round the poles of the equator, or of the world.

ARCTICA, in conchology, a species of Mya found in the North Seas. Also a species of argonauta found on the coast of Greenland.

ARCTICA, in ornithology, a species of alca, known in England by the name of puffin. It is the pica marina of Aldrovandus, psittacus marinus of Marten, and the macareux of Buffon. See ALCA.—Also a species of colymbus.

ARCTIUM, BURDOCK, a genus of the polygamia order, belonging to the syngenesia class of plants; and in the natural method ranking under the forty-ninth order, compositæ-capitatæ: CAL. globular, with seeds, having hooks reflected at the tops. There are three species: viz. A. lappa, A. personata, and A. tomentosum: they are all troublesome weeds. The tender stems of the lappa, or common burdock, however, deprived of the bark, may be boiled and eat like asparagus. When raw they are good with oil and vinegar. Cows and goats eat this herb; sheep and horses refuse it; swine are not fond of it. The seeds, which have a bitterish subacrid taste, are recommended as very powerful diuretics, given either in the form of emulsion, or in powder, to the quantity of a dram. The roots, which taste sweetish, with a slight austerity and bitterishness, are esteemed aperient, diuretic, and sudorific; and said to act without irritation, so as to be safely ventured upon in acute disorders.

ARCTOMYS, MARMOT, in zoology, a genus of glires in the class of mammalia: the characters of which are: two cutting teeth in each jaw, five grinders above and four below, on each side; and that have collar bones. This genus is very properly separated from that of mus, by Dr. Gmelin, after Mr. Pennant. Most, if not all the species, hybernate, or become torpid, during the winter: they wander in quest of food, and for other purposes, during the day, feeding on roots and grain: they are capable of climbing, and dig burrows in the earth for their habitation; their heads are generally round and convex, having either very short ears, or none; their bodies are thick, with short hairy tails; the fore feet have each four toes, and a very short thumb, or fifth inner toe; and the hind feet have each five toes. The cæcum, or blind gut, is generally very large. The species are; A. marmota, mus marmota of Linnæus, Alpine or mountain mouse, Alpine marmot of Pennant, and marmotte of Buffon. It has short round ears; the upper parts of the body dusky brown, and the lower parts reddish. The body thick and short; the head large and thick, flattened at the top; the two bones of the lower jaw movable on each other; the cheeks covered and surrounded with long hairs; the muzzle has seven rows of whiskers; above and below each eye is a black wart, on which are hairs; the legs are short; the tail is straight, and covered with long hairs; the tip of the tail very dark brown, almost black; the body and head measure sixteen inches, and weigh nine pounds; the tail is about six inches long. These animals inhabit the highest summits of the Alps and Pyrenæan mountains, in dry places where are no trees; feed on insects, roots, and vegetables; are fond of milk, which they take by lapping with a murmuring noise, and drink very little. They live in societies of from five to fourteen, and place a sentinel, which whistles on the approach of danger, when they retire into their holes; or, if they cannot escape, defend themselves with fury. A. bobac, Schrebner, Gmelin, Cuvier. Bobac ou marmotte de Pologne, Buffon. Bobac marmot, Pennant. Covered with greyish fur above, the under parts of the body fulvous; the tail short and well covered with hair. Its general habits similar to the preceding, and inhabits, says Pallas, 'the high,

but milder and sunny sides of mountainous countries, which abound with firsill or free-stone rocks, where it is found in dry situations, and such as are full of woods, springs, or sands.' It is very numerous in Poland and Russia, and very frequently in Kamtschatka, but rarely as high as lat. 55°. A. Monax, mus griseus of Pallas, glis fuscus, marmota Americana or American marmot, monax of Edwards and Buffon, and Maryland marmot of Pennant, has short rounded ears, bluish nose and cheeks, body of deep brown color, and longish tail, which is very hairy. The eyes are black and prominent; the feet and legs black, with long sharp claws; the tail is half the length of the body. This animal is about the size of a rabbit, and feeds on vegetables: its flesh is very good, resembling that of a pig. It inhabits the warmer States of North America and the Bahamas. In America it forms holes in the clefts of rocks, and under the roots of trees. A. Empetra of Pallas, Canadian marmot, Quebec marmot of Pennant, of a mixed grey color on the upper parts of the body, the lower parts orange, with short rounded ears, and a hairy tail. This animal inhabits Canada, Hudson's Bay, and the other northern parts of America. It is rather larger than a rabbit, with a short tail. The cheeks grey; the face dusky; on the back the hair is gray at the roots, black in the middle, and whitish at the tips; the belly and legs of an orange color; the feet are black and naked, with four long slender divided toes, and the rudiments of a thumb on each fore-foot, and five similar on each behind, all armed with pretty strong claws. A. Pruinosa, hoary marmot, with very coarse long hoary fur, whitish cheeks, a black nose, and black legs, having short oval ears. Inhabits the northern parts of America; is about the size of a rabbit; with nose black at the tip; the tail is black, mixed with rust color; with four toes on each fore foot, and five behind, all armed with dusky claws. A. Suslica, Souslik of Buffon, Casan marmot of Pennant, has the upper parts of the body of a yellowish-brown color interspersed with numerous small white spots, very short ears, hairy tail about the length of the thighs. Inhabits Casan as far as Austria, dwells in the desert, digging holes in the black soil of the declivities of the mountains; which burrows are seven or eight feet long, winding, with several entries, having at the bottom several apartments, stored with corn, peas, linseed, hempseed, and other grains and seeds, in separate cells, and separate holes in which they live. This animal is about the size of a large rat; A. citillus, zisel of Buffon, earless marmot of Pennant, is of an uniform dark cinereous grey color, has no external ears, a blunt nose, a long slender body, and a very short tail; inhabits Hungary, Austria, and Poland; burrows like the former, and is rather larger, being nearly a foot in length. A. zemni, zemni of Buffon, podolian marmot of Pennant, zits-jan of Le Brun, and little earth-dog of Rzaczinski, is of a mouse-grey color, has short rounded ears, five toes on all the feet, and very minute eyes concealed beneath the fur. Inhabits Russia and Poland; is larger, stronger, and more mischievous than the former. The fur is very good in the spring, and the flesh is reckoned tolerable. These animals are preyed on by pole-cats, weasels, hawks, carrion-crows and cranes. They vary considerably both in size and color. Gmelin suggests that this animal may be the same with the mus ponticus of Aristotle and Pliny. A. gundi, gundi of Pennant, is of a brick-dust red color, with wide open ears, which appear as if cropt or cut off. Inhabits Barbary, near Massusin, towards mount Atlas. Its size is about that of a small rabbit; the tail is short; the upper fore-teeth are large and truncated, the lower ones slender and pointed; it has four toes armed with claws on all the feet, and uses the sole in walking as far as the heel. A. Hudsonia, Hudson's marmot, tailless marmot of Pennant; is of a brown-ash color, with short external ears and no tail. Inhabits Hudson's Bay. It has two cutting teeth above, and four in the lower jaw; the hairs are tipt with white. A. maulina, Chilese marmot, is of a reddish-brown color, with sharp ears, having five toes on all the feet. Inhabits Chili.

ARCTOPHYLAX, in astronomy, a constellation, otherwise called Bootes.

ARCTOPUS, in botany, a genus of the order polygamia; class, dicœcia; natural order, forty-fifth, umbellatæ. The umbella of the male is compound; the involucrum consists of five leaves; the corolla has five petals; the stamina are five; and the pistilli, two. The umbella of the hermaphrodite is simple; the involucrum is divided into four parts, is spinous, large, and contains many male flowers in the disc. There is but one species of arctopus: viz. A. echinatus, prickly-leaved arctopus. A handsome plant from the Cape of Good Hope; introduced in 1774 by Mr. F. Masson.

ARCTOTIS, in botany, a genus of the polygamia necessaria order and syngenesia class of plants; natural order, forty-ninth, compositæ-discoides. The receptacle is bristly; the corona of the pappus is pentaphyllous; and the calyx is imbricated with scales loose at the top. It is commonly called anemospermos, from the resemblance of its seeds to those of the anemone. There are sixteen species, natives of Ethiopia, or of the Cape of Good Hope. Of these, 1. A. angustifolia, with spear-shaped leaves, and 2. A. aspera, with wing-shaped woolly leaves, are most remarkable for their beauty, having rays of a fine yellow or deep gold color. They flower in May and June. All the species of actotis may be propagated by cuttings; which should be frequently renewed, as the old plants are subject to decay in winter. They may be planted, in any of the summer months in a bed of light fresh earth, observing to shade them from the sun until they have taken root. They should be exposed to the open air until the latter end of October, when they must be removed into the green-house.

ARCTURUM Infra, a small star of the seventh or eighth magnitude, to the south of Arcturus, observed by Mr. Flamsteed, and so named by him. Its place is not determined in the British catalogue.

ARCTURUS, in astronomy, a fixed star of the first magnitude, in the constellation of Arctophylax, or Bootes. The word is formed of

αρκτος, bear, and ουρα, tail; i. e. bear's tail, as being very near it. This star was known to the ancients, and is mentioned by Job, and also by Virgil. Mr. Hornsby concludes that Arcturus is the nearest star to our system visible in the northern hemisphere, because the variation of its place, in consequence of a proper motion of its own, is more remarkable than that of any other of the stars; and by comparing a variety of observations respecting both the quantity and direction of the motion of this star, he infers that the obliquity of the ecliptic decreases at the rate of 58″ in 100 years; a quantity which nearly corresponds to the mean of the computation framed by Mr. Euler and M. de la Lande, upon the principles of attraction.

ARCTUS; αρκτος; in astronomy, a name given by the Greeks to two constellations of the northern hemisphere; by the Latins called ursa major and minor; and by us the greater and lesser bear.

Arctus, in entomology, a species of cancer, having ciliated antennæ with spines.

ARCUALIA Ossa, in anatomy, a name used by some for the ossa syncipitis, by others for the ossa temporum.

ARCUALIS Sutura, among surgeons, denotes the coronal suture.

ARCUANA, in entomology, a species of phalæna found in Europe; the phalæna tortrix, &c. of Linnæus.

ARCUANUS, in ichthyology, a species of chætodon found on the Arabian coasts.

ARCUARIA, in entomology, the phalæna (geometra) of Gmelin.

ARCUATA, a species of coccinella, a native of China. Also a species of cassida found near Rio Janeiro.

ARCUATION, in gardening, the method of raising by layers such trees as cannot be raised from seed, or that bear no seed, as the elm, lime, alder, willow; and is so called from bending down to the ground the branches which spring from the offsets or stools after they are planted. Strong mother plants, or stools, must be planted in a clear border and in a straight line, about six feet asunder. When these have shot five or six main branches from the root, and as many collateral branches, the former must be bent to the ground and there fastened. The small branches must be covered three inches deep upon the joints, and have a large basin of earth made round them to hold the water. About the middle of September they may be opened, and if they have taken root may be immediately removed into the nursery; but if they have not sufficiently extended their roots they must be suffered to remain till the spring, and then transplanted.

Arcuation; from arcus, a bow; is used in surgery for an incurvation of the bones; such as we see in the case of rickets, &c.

ARCUBALISTA, in the military art, a kind of balista, probably made after the fashion of a bow. It is mentioned by Vegetius; but the description of it is omitted by him as too well known then, though now hard to be discovered.

ARCUBALISTARII, or Manubalistarii, archers who fought with the arcubalista.

ARCUCCIO, or Arcutio, a machine made of a board covered with pieces of hoops, like the tilt of a wagon; used in Italy to prevent children from being overlaid and smothered by nurses or others. Every nurse in Florence is obliged to lay her child in an arcuccio, under pain of excommunication.

ARCUDI (Alexander Thomas d'), a Dominican of Venice, who gained considerable fame by his writings. They were mostly biographical, of which the principal is his Gallatina Letterata. The history of Athanasius was his last work. He died about 1720.

ARCUDIUS (Peter), a Greek priest, born in the isle of Corfu. He was sent by Clement VIII. to Russia to settle some religious differences; and he wrote several zealous pieces in defence of the Catholic religion against the Greek and Protestant churches. He died about 1632.

ARCUS, in entomology, a species of papilio; the papilio alcon of Gmelin, found in Surinam.

ARCY (Patrick d'), one of the pensioners of the French academy, marshal of the armies of the king, and knight of the order of St. Louis, was born of Roman Catholic parents at Galway in Ireland, on the 27th September, 1725. He was sent to Paris at the age of fourteen, to the charge of one of his uncles; and when very young entered the French service. He served two campaigns in Germany before 1746; and in that year sailed in the expedition sent by the French to aid the Pretender's cause. Though taken prisoner in the fleet, he was not punished for bearing arms against his country, but passed as a French officer. He entered the academy about 1749, with the high reputation which two admired memoirs on mechanics had procured him. In 1750 he published a memoir on artillery, a subject connected with his own profession. In 1754 he published another memoir upon the subject of hydraulic machines. In 1767 he visited Ireland; but though importuned by his uncle to remain in his native country, and even offered affluence if he would comply, he returned to France. Three years afterwards he was made field-marshal and pensionary of the academy. Before the death of his uncle, by whom he was educated, he inherited a large fortune, married his niece, and took the title of Count d'Arcy. He died in 1779 with the reputation of great and cultivated powers, and profound views in the mathematical and physical sciences.

ARDA, a species of termes inhabiting Sierra Leone in Africa. The insects of this species are black; segments of the abdomen white at the tips, legs pale.

ARDAMA; from αρδω, to water; in antiquity, a vessel of water placed at the door of a person deceased till the time of burial, as a token that the family was in mourning, and to serve to sprinkle and purify persons as they came out of the house.

ARDARGIE, a village of Scotland, in the parish of Forgandenny in Perthshire, seated on the Ochil hills, and containing about eighteen farm-houses. Near here is a place called the Roman camp, of a square form, about ninety yards every way, defended on one side by a deep hollow, through which runs a rivulet; and on

the other three by trenches of ten yards wide at the top and fourteen feet deep.

ARDASSES, in commerce, the coarsest of all the silks of Persia; and, as it were, the refuse of each kind. In this sense they say the legis, the housets, the choufs, and the payas ardasses, to signify the worst of these four sorts of Persian silks.

ARDASSINES, in commerce, called in France ablaques; a very fine sort of Persian silk, little inferior in fineness to the cherbassis, and yet little used in the silk manufactures of Lyons and Tours, because it will not bear hot water in the winding.

ARDCHATTAN, a parish of Scotland, in the county of Argyle, united to that of Muckairn. These united parishes extend twenty-four Scotch miles in length and about twenty in breadth, and contained in 1792 about 2350 inhabitants. In the monastery of Ardchattan, the ruins of which still remain, a parliament was held by king Robert Bruce after his defeats at Methven and Dalrie; and it is said the debates were carried on in the Celtic language, which is still the common language of the people.

ARDCLAGH, a parish of Scotland, in the extremity of the shire, and lying south-east of the town of Nairne; about eleven miles long and nearly eight broad.

ARDEA, in ancient geography, a town of Latium, the royal residence of Turnus king of the Rutuli; so called, either from the augury of the heron, or from the excessive heat of the country. It was a marshy, sickly, situation. Virgil says it was built by Danaë the mother of Perseus: it lay about five miles distant from the sea and twenty from Rome, and was a Roman colony. It is now a village in the Campagnia di Roma.

ARDEA, in ornithology, a genus of the order of grallæ. The general characters of this order are these: the bill is straight, sharp, long, and somewhat compressed, with a furrow that runs from the nostrils towards the point; the nostrils are linear; and the feet have four toes. Under this genus Linnæus comprehends the grus or crane, the ciconia or stork, and the ardea or heron of other authors. Ninety-six species have been enumerated and thus subdivided:

A. Crested: bill scarcely longer than the head.
B. Cranes: head bald.
C. Storks: orbits naked.
D. Herons: middle claw serrate inwardly.
E. Herons: bill gaping in the middle.

Every quarter of the globe furnishes some species. We can only notice the following:

1. A. Americana, or hooping-crane of Edwards, a native of America. The crown of the head and temples are naked and papillous; the forehead, nape of the neck, and prime wing-feathers are black; but the body is white: the under part of the head, as far as the lower chap, red; the beak yellowish and jagged at the point; the feet red and the prime tail-feathers white. In spring these birds go north to breed like the common crane, and return like that bird to the south in autumn. They lay two white eggs like those of the swan, and sit twenty days. They have a long loud note, and their food is worms and insects. The natives of Hudson's Bay call this species, wapaw-uchechauk. 2. A. Argil, or hurgil, of Ives is a very large species; from tip to tip of the wings measuring fourteen feet ten inches; and from the tip of the bill to the claws seven feet and a half: the bill is sixteen inches round at the base, of different colors, and nearly of a triangular shape; the feathers of the back and wings very strong, and of an iron color; those of the breast long; over the belly a great deal of down of a dirty white; the legs and half the thighs are naked; the naked parts full three feet in length. This monster, as Ives terms it, inhabits Bengal, and is also found at Calcutta; called at the last place hurgil. The common opinion is that the souls of the Brahmins possess these birds. The same species has been remarked in Africa. 3. A. ciconia, or white stork of Ray, has naked eye-balls, and black prime wing-feathers. The skin below the feathers, as also the beak, feet, and claws, are of a blood color. It is a native of Europe, Asia, and Africa; but is seldom or never to be met with in Italy. The ciconia feeds upon amphibious animals. It is such an enemy to serpents, that it is reckoned almost a crime to kill a stork. From this favorable treatment, they are seen in Holland and the Low Countries walking unconcerned in the middle of the streets. Storks are birds of passage; they spend the summer in Europe, go off to Egypt, Ethiopia, &c. all at once before winter, and do not return till about the middle of March. 4. A. garzetta, or egret, crested behind; the body white, the beak black, and the feet greenish. It is a most elegant bird; a native of the East, but found in the south part of Europe. The scapulars and the crest were formerly much esteemed as ornaments for caps and head-pieces; so that aigrette and egret came to signify any ornament to a cap. 5. A. grus, or common crane of English authors. This species is far spread, being met with in great flocks throughout northern Europe and Asia; in Sweden, throughout Russia, and Siberia as far as the river Anadyr, migrating even to the arctic circle. In winter they inhabit warmer regions. In their migrations they frequently fly so high as not to be visible. 6. A. herodias, or cristata maxima of Catesby, crested behind, has a dusky-colored back, reddish thighs, and the breast speckled with oblong black spots. It is four feet and a half when erect; the bill is about eight inches from the angle of the mouth to the end of it; and the crest is made up of long, narrow, brown feathers, the longest being five inches in length, which it can erect and let fall at pleasure. It is a native of Virginia, and feeds not only upon fish and frogs, but on lizards, efts, &c. 7. A. leucogeranos of Pallas, or the Siberian crane of Pennant, four feet and a half when standing erect. The bill is of a red color; the irides are white: the plumage is white as snow, except the ten first greater quills, with the coverts of them, which are black: the legs are long and red. This species inhabits the marshes and lakes of Siberia. 8. A. major, or common heron, a native of Europe. This bird is remarkably light in proportion to its bulk, scarcely weighing three pounds and a half: the length is generally three feet two inches; the breadth five feet four. This

bird was formerly much esteemed as food; made a favorite dish at great tables, and was valued at the same rate as a pheasant. It is said to be very long-lived. Heron-hawking was once a celebrated sport; and a penalty of twenty shillings was imposed on any person taking the eggs.—The cinerea of Linnæus is the female of this species. 9. A. pavonia, or the crowned crane, has an erect bristly crest, with the temples and two wattles naked. It is a native of Africa, particularly of the coast of Guinea, as far as Cape Verd; at this last place they are said to be exceedingly tame, and will often come into the court-yards to feed with the poultry. 10. A. stellaris, or the bittern, has a smooth head, and is variegated through the body with dark-colored spots of different figures and sizes. It is a native of Europe, and inhabits the fen countries. In the reign of Henry VIII. it was held in much esteem at our tables. Its flesh has much the flavor of a hare, and nothing of the fishiness of that of the heron. 11. A. violacea, or crested bittern of Catesby, has a white crest; the body is variegated with black and white, and bluish below. These birds are seen in Carolina in the rainy seasons; but in the Bahama Islands they breed in bushes growing among the rocks in prodigious numbers. 12. A. nigra has a straight greenish bill and crimson irides. It is frequently kept in menageries, being endowed with great gentleness of manners, added to its being an elegant bird. At various times it puts itself into strange and uncouth attitudes, especially those which imitate dancing. The name this bird is known by in the east is kurki, or querky. Sometimes it will breed in confinement: one is recorded to have lived twenty-four years at Versailles, where it had been bred. It is a native of Africa and the east.

ARDEBIL, or ARDEVIL, a town of Persia, in the province of Aderbijan. It was taken and burnt by Jenghiz Khan in 1222, when most of the inhabitants were destroyed, but it has been since rebuilt; and is still ranked for dignity among the best cities of the kingdom, on account of its having been the residence and burying place of some of the Persian kings; particularly the sepulchre of Sheik Sefi is at this place, to which the people resort in pilgrimage. Three or four of the large principal streets have shops, and are planted on each side with elm and linden trees, to keep off the excessive heat of the sun; but the houses are poorly built, yet most of them have the conveniency of a garden. The meidan, or great square, is 300 paces long and 150 broad, having shops all round; which, when this place was in a florishing condition, were stored with all manner of valuable commodities. Through the city two branches of a rivulet pass, which have been sometimes so much swelled by the melting of the snow on the mountains, as to break down the dykes, and carry away a great number of houses. The city is without walls, and is seated in the midst of a large plain encompassed with mountains, the highest of which lies westward, and is always covered with snow. These render the air sometimes extremely hot, and at others intolerably cold; which occasion epidemical distempers, that carry off great numbers of people. The soil produces no fruit near the city but apples, pears, and peaches; and yet is good for both corn and pasture; and the sheep are numerous. There are here several sorts of mineral waters, and springs which produce as hot water as if it was boiling, and from which waters are conveyed to the public baths in the city. About half a league from the city, on the right hand of the public road, there is a pool of standing water, which is covered over with salt like ice. Ardebil is situated about twenty-five or thirty miles east of Tauris.

ARDECHE, a department of France, bounded on the east by that of Drome; on the south by Gard; on the west by Lozere, and on the north by Upper Loire; and so called from a river of the same name which falls into the Rhone. It contains 2376 square miles, and had, in 1816, a population of 284,743. It now contains three arrondissements, namely, those of Privas, Tournon, and Argentiere. This department, with that of the Lozere, forms the diocese of the bishop of Mende. In the southern parts there is raised a great deal of wine and silk. In the northern districts, however, on account of the barren and stony nature of the soil, the inhabitants with equal industry can with difficulty procure a livelihood.

ARDEE, or ATHERDEE, a town of Ireland, in the county of Louth, thirty-four miles north-west of Dublin. It has a mount called Castle-Guard nearly ninety feet high, which seems to have been an artificial work. The main trench is between thirty and forty feet deep: the circumference at the top is about 140; and round the foundation it is upwards of 600. Some suppose it to have been a sepulchral monument or royal burying place; others that it was a place of assembly for the people to debate on public affairs.

ARDEN, a common name of forests among the ancient Celtæ, from the widely extensive one which ranged for 500 miles in length across the country of Gaul, or another which covered more than half the county of Warwick in Britain, and the sites of which still retain the appellation of Arden, to the much smaller one of the ancient Mancenion, that covered and surrounded the site of the present Manchester. It was written Arduen by Cæsar and Tacitus; in speaking of the forest in Gaul, as well as by Ossian, who only changes the *u* into *v*, in mentioning the woods of Caledonia. Ard signifies either high or great, and ven or den either a hill or wood. Arduen, Ardven, or Arden, then, means a considerable wood. Thus the name became applicable to such sites as the plains of Warwickshire and the hills of Scotland; and it was given, not only to the most extensive forests, to that which was the greatest in Gaul, or so considerable in Britain; but to many that were important only within their own contracted districts, as the wood of Mancenion and others.

ARDEN (Edward), a gentleman of good family in Warwickshire, was born in 1532. Becoming a zealous Roman catholic, he was apprehended for a supposed plot against Queen Elizabeth, and executed in 1583. This unfortunate person is now generally supposed to have fallen a victim to the vengeance and implacable malice of that

unworthy favorite of Elizabeth, the earl of Leicester.

ARDENNES, a department in France, bounded by the Netherlands and the department of the Meuse to the north and east, the department of the Aisne to the west, and that of the Marne to the south. Its length is computed at twenty-five leagues, and its breadth at eighteen; and there are 346,000 inhabitants. It is a frontier department, comprehending the ancient French duchy of Rhetelois, the province of Remois, and part of Argonne, the French portion of Namur, and the government of Sedan. The taxes paid by this department exceeded £100,000 sterling. It is watered by the Aisne and Meuse, and produces grain of all kinds, wood, iron, coal, and slate. But its riches lie in its forests, its pastures, and its cattle, and tolerable wine may be obtained in some parts of the south. The iron mines are productive, especially those in the arrondissements of Mezieres and Retel. The roads are so narrow in some places, that two waggons cannot pass each other; and therefore the waggoners are obliged to provide themselves with bells or horns to give one another notice to stop in time.

ARDENNES, a forest in France, formerly of vast extent; but the trees are in many places dug up, and where they stood are built cities, towns, and abbeys. At present it extends from Thionville near the country of Liege, to Donchery and Sedan, on the confines of Champagne.

AR'DENT, AR'DENCY, AR'DENTLY, AR'DOUR. Lat. *ardeo, ardens*, to be on fire. Having the property of burning, or excessive, heat. The warm passions, when persevering, are termed ardent, vehement. Also applied to spirituous liquors.

Nor delay'd the winged saint,
After his charge received; but, from among
Thousand celestial *ardours*, where he stood
Veil'd with his gorgeous wings, up-springing light,
Flew thro' the midst of heav'n. *Paradise Lost.*

A knight of swarthy face,
High on a coal-black steed, pursued the chace;
With flashing flames his *ardent* eyes were fill'd.
Dryden.

The soldiers shout around with gen'rous rage;
He praised their *ardour*, inly pleased to see
His host. *Id.*

Another nymph with fatal power may rise,
To damp the sinking beams of Cælia's eyes;
With haughty pride may hear her charms confest,
And scorn the *ardent* vows that I have blest.
Prior.

Unmov'd the mind of Ithacus remain'd,
And the vain *ardours* of our love restrain'd.
Pope.

With tender billet-doux he lights the pyre,
And breathes three am'rous sighs to raise the fire;
Then prostrate falls, and begs, with *ardent* eyes,
Soon to obtain, and long possess, the prize. *Id.*

Pray'r *ardent* opens heav'n, let's down a stream
Of glory on the consecrated hour
Of man in audience with the deity. *Young.*

Behold, fond man!
See here thy pictur'd life: pass some few years,
Thy flow'ring spring, thy summer's *ardent* strength,
Thy sober autumn fading into age,
And pale concluding winter comes at last,
And shuts the scene. *Thomson.*

As Descartes has kindly shown how a man may prove to himself his own existence, if once he can be prevailed upon to question it, so the *ardent* and adventurous will not be long without finding some plausible extenuation of the greatest difficulties. *Rambler.*

And many a band of *ardent* youths were seen;
Some into rapture fired by glory's charms,
Or hurl'd the thundering car along the green,
Or march'd embattled on in glittering arms.
Beattie.

ARDENTES, in authors of the middle age, an appellation given to those afflicted with the erysipelas; so called, as seeming to be scorched by the disease. Hence also the abbey of St. Genevieve at Paris was called Domus Ardentium, by reason, as it is said, of great numbers having been cured of that distemper at the shrine of this saint in the reign of Louis VI.

ARDEOLA, in ornithology, the ardea minuta of Linnæus.

ARDERN (John), an English surgeon of Newark upon Trent, whom many extol as the first reviver of surgery in England. He florished in the fourteenth century; and wrote a treatise on the fistula in ano. In the Sloannian library there is likewise a MS. of his entitled De Re Herbaria, Physica, et Chirurgica. His treatise on the fistula was published in 1588.

ARDERSIER, a parish of Scotland, in the county of Inverness, two miles and a half in length and as much in breadth.

ARDES, a peninsula of Ireland, in the county of Down, nearly surrounded by the Irish channel, and the bays of Strangford and Carrickfergus. It was anciently a county by itself, as appears from a patent roll of 1 Henry I. A. D. 1400, in Birmingham's tower, Dublin castle, granted to Robert Fitz-jordan Savage, the office of sheriff of Ardes in Ulster.

ARDES, a town of France, in the department of Puys de Dome, a great mart for inland trade. Lon. 3° 10′ E., lat. 45° 22′ N.

ARDFERT, a town of Ireland, and the ancient capital of Kerry. It had a university, which was held in the highest esteem. It is a bishop's see, and borough by ancient prescription, and has been held in commendam with the bishopric of Limerick ever since the restoration. The bishops were anciently called bishops of Kerry. Near the cathedral was an anchorite tower, the loftiest and finest in the kingdom, being 120 feet high: it fell suddenly in 1770 In the ruined churches there are several inscriptions round the mouldings of the tomb-stones; and over an arch, behind Lord Glandore's house, is an inscription in relief in a masterly manner, but the characters are unknown.

ARDGLASS, an ancient but decayed sea-port town of Ireland, in the county of Down, of which it was formerly the principal city. It has a long range of buildings in the style of a castle, called by the inhabitants the New Works, although they are so old that there is no tradition when or for what purpose they were built. This range of fortification extends 250 feet in length and twenty-four in breadth. The walls are three feet thick and have three towers in front, one at each end, and one in the centre, which makes them appear uniform and elegant.

The buildings have been divided into thirty-six apartments, eighteen above and eighteen below; with a stair-case in the centre. Each apartment on the ground floor has a small Gothic door, and a large square window; which would seem to indicate that they had been shops or warehouses, occupied at some very early period by mercantile people from abroad. Within ten feet of the south tower stands a square fort, called Horn-castle, from the great quantity of oxen and deers' horns found about it. It measures forty feet by thirty, consists of two stories, and, from the fire places, appears to have been the kitchen and dining-hall belonging to the inhabitants. There are also relics of several other castles, towers, and gates, within the north-east point of Ardglass harbour. There is also a curious natural cave on the shore. The duties of this port were farmed so lately as the reign of Charles I. It lies seven miles north-east of Downpatrick.

ARDISIA, in botany, a genus of plants, class pentandria, order monogynia. Generic characters: CAL. five-leaved: COR. hypocrateriform, limb reflexed. Antheræ large and erect. Stigma simple. Drupa superior, one-seeded. Of this genus there are several species found in different parts of the world.

ARDKINGLASS, an ancient seat in Argyleshire, belonging to the Campbells of that title. The castle of Ardkinglass is very ancient, and is composed of three separate towers, each of them fronting an area within. The space between the towers is defended by a strong wall about fifteen feet high; and the gate by a small tower, immediately above it, called the gate tower. The castle is built in a low situation, and could not stand out against a regular investment. The time in which this castle was built is not known; but there is certain evidence of its having been repaired in the year 1586. The old residence of the family of Ardkinglass, of which the ruins can now scarcely be traced, was at a small distance from the present castle, but in a more commanding situation.

ARDOR VENTRICULI, a heat of the stomach, usually expressed by the term heart-burn, or cardialgy.

ARDRA, or ARDRAH, a small kingdom of Africa, in Guinea, on the gulf of St. Thomas. The inhabitants are very licentious, and have neither temple nor any place for religious worship. They are, however, very courageous; and their king was absolute till lately that the king of Dahomey made war upon this and the neighbouring territories, brought them under subjection, and burnt the towns, particularly Ardres. The air is very unwholesome to Europeans; yet the natives live to a great age; but the small-pox makes great destruction among them. This country is fertile in Indian corn, palm-wine, plants, and fruits, which last all the year; and they make a great deal of salt.

ARDRAH, or ARDRES, the capital of the above kingdom. Lon. 1° 52′ E., lat. 6° 36′ N.

ARDRES, a small but strong town of France, in the department of the straits of Calais, arrondissement of St. Omers. An interview was held near it between Francis I. and Henry VIII. king of England, in 1520; and the plain where the monarchs met was long afterwards called the Field of Gold-cloth, on account of the finery and wealth displayed on that occasion. Ardres is seated in the midst of a morass. Lon. 2° 0′ E., lat. 50° 50′ N.

ARDROSSAN, a parish of Scotland, in Ayrshire, six miles long from north to south, and between three and five broad from east to west. 'The castle of Ardrossan is of unknown antiquity. Its walls were entire when Cromwell visited this part of the country, and fixed his head-quarters at the county town. That usurper had rendered himself very unpopular by occupying the church of Ayr as an armoury; and to conciliate the minds of the people to his measures, he beautified the town, by building the fort and parapet, which are yet standing. For this purpose he threw down the walls of the Castle of Ardrossan, and carried the stones in boats over sea; so little were quarries known in those days, in which the county of Ayr almost everywhere abounds. After the restoration, the fort of Ayr, and ground about it, were granted to the family of the earl of Eglintoune in reward of their loyalty, and by way of compensation for the demolition of the castle of Ardrossan.

ARDS, a barony in the county of Down in Ireland. It is a narrow slip of land, in some places three, and in none above six miles broad; lying between the lake of Strangford and the sea, and in the south part opposite to Lecale.

ARDSTINCHAR, a river of Scotland, in Aryshire, which runs for about twenty-five miles through the county, and falls into the sea at the village of Ballantrae. At the mouth of this river there is a considerable salmon fishery, which yields a rent of above £80 a-year; but the river, being rapid and shallow, can only admit of small boats. The salmon are thought as good as any in Scotland, and sell upon the spot at a very low price.

ARDUBA, an ancient city of the Pannonians. It was taken by Germanicus about the seventh year of the Christian era; but its reduction was more owing to the disagreement that reigned among the inhabitants than to the valor of the Romans. The greater part of the citizens were for submitting; but the women, more fond of their ancient laws and liberties than the men, joined some Roman deserters, and falling upon their husbands, killed a great number of them; but being at last overcome by the men, who then submitted to the Romans, the women either threw themselves headlong from the tops of the walls, or, setting fire to their houses, burnt themselves and their children to death.

ARDVERT, a town of France, on the coast of Saintonge, in the department of the Lower Charente, and is the head of a canton. A trade is carried on in salt, wine, and fish, both fresh and salted, particularly sardels. The peninsula of this name has many morasses and forests, but the coasts afford excellent fishing. It includes the tract of country lying between the Garonne, the Seudre, and the sea. Population 2500. Six leagues and a half W. of Sainte.

ARDUINA, BASTARD LYCIUM, in botany, a genus of the pentandria monogynia class; he

corolla of which has a single petal; the stigma is bifid, and the fruit is a double-celled berry with a single seed. There is only one species.

AR'DUOUS. Lat. *arduus*, high. According to Vossius, from *ardeo*, to burn, because flame ascends, and as it were seeks high places. Difficult, laborious, from the object of pursuit being placed on an eminence; steep and inaccessible.

High on Parnassus' top her sons she show'd,
And pointed out those *arduous* paths they trod. *Pope.*

The translation of Homer was an *arduous* undertaking, and the translator entered upon it with a candid confession that he was utterly incapable of doing justice to Homer. *Cumberland.*

In every *arduous* enterprise we consider what we are to lose, as well as what we are to gain; and the more and better stake of liberty every people possess, the less they will hazard in a vain attempt to make it more. *Burke.*

ARE, in French measure, is a superficial unit, or a square containing 94,831 square feet.

A RE denoted in solmisation the second note of Guido Aretinus, the first space A, bass clef, upon which, in the singing of exercises without words, the syllable re was always sung.

A'REA. From Lat. *areo*, to dry. A thrashing floor, or barn floor, where corn might be dried. Any vacant space bounded on all sides, or before a public building has acquired the name.

Let us conceive a floor or *area* of goodly length, with the breadth somewhat more than half the longitude. *Wotton.*

The Alban lake is of an oval figure; and, by reason of the high mountains that encompass it, looks like the *area* of some vast amphitheatre. *Addison.*

In *areas* vary'd with Mosaic art,
Some whirl the disk, and some the jav'lin dart. *Pope.*

We came to a kind of circus of vast extent, in the middle of a thick forest: within the circus was an *area* prepared for the combatants, surrounded by a circular bank of fresh turf, on which were an innumerable multitude of spectators. *Hawkesworth's Telemachus.*

AREA; from areo, to be dry; in architecture, denotes the space or site of ground on which an edifice stands. It is also used for inner courts, and similar portions of ground.

AREA, in geometry, the superficial contents of any figure. Thus, if a figure be in form of a square, and its side be 40 feet long, its area is said to be 1600 square feet; or it contains 1600 squares, a foot each every way.

AREA, in medicine, a disease which makes the hair fall off. The area is a general kind of depilation; and is distinguished into two species, alopecia and ophiasis.

AREAD'. Ang.-Sax. arædan, to conjecture. To guess, to declare, to explain, to counsel.

Knights' and ladies' gentle deeds;
Whose praises having slept in silence long,
Me, all too meane, the sacred muse *areads*
To blazon broad. *Faerie Queene.*

But mark, what I *aread* thee now. Avaunt!
Fly thither, whence thou fled'st! If from this hour
Within these hallow'd limits thou appear,
Back to th' infernal pit I drag thee chain'd.
Paradise Lost.

AREATA, in entomology, a species of phalæna geometra, the phalæna area of Cramer. It is found in Surinam.

AREATUS, in entomology, a species of scarabæus cetonia found in Virginia.

AREBO, or ARBON, a town on the slave-coast of Guinea, in Africa, seated at the mouth of the river Formosa. The English had once a factory there, as the Dutch have still. It is a large oblong place, with a considerable population, and furnished with houses built of reeds and leaves. Long. 5° 8′ E., lat. 5° 58′ N.

ARECA, in botany, the faufel nut, a genus of the order of palmæ pennatifoliæ. The male has, CAL. none; three petals and nine stamina; the female, CAL. none, the corolla has three petals There are two species, viz. 1. A. catechu, a native of India. It has no branches, but its leaves are very beautiful; they form a round tuft at the top of the trunk, which is as straight as an arrow. It grows to the height of twenty-five or thirty-five feet, and is a great ornament in gardens. The shell which contains the fruit is smooth without, but rough and hairy within; in which it much resembles the shell of the cocoa nut. Its size is equal to that of a large walnut. Its kernel is the size of a nutmeg, to which it bears some resemblance. In the centre of the fruit, when soft, is contained a grayish moist substance, which grows hard in proportion as it ripens. The extract of this nut has been supposed to be the terra japonica of the shops; but, according to later observations, the genuine drug seems to be obtained from the mimosa catechu. The fruit when ripe is astringent, but not unpalatable, and the shell yellowish. Of this fruit there is a prodigious consumption in the East Indies, there being scarcely any person, from the richest to the poorest, who does not chew it with the leaves of betel, generally mixing with it lime made of sea-shells. When prepared for mastication it is called pinang, a Malayan word used all over the East Indies. The chewing of pinang causes much spitting, whether it be made with dried or fresh areca, and tinges the teeth and spittle of a deep red color. This mastication cools the mouth, and fastens the teeth. When they have done chewing the pinang, they spit out the gross substance that remains in the mouth, and wash their mouth with fresh water, and their teeth then resume the natural color. The Europeans who live at Batavia, or Malacca, and in the Sunda and Molucca islands, use pinang as much as the Indians do; but by washing their teeth they preserve them white. Some assert that areca strengthens the stomach, when the juice of it is swallowed, as most of the Indians do. Another property ascribed to it is, its purifying the gums. When eaten by itself, as is sometimes done by the Indians, it impoverishes the blood, and causes the jaundice; but not when mixed in the usual way with betel. The best areca of the Indies comes from the island of Ceylon. The Dutch East India Company send a great deal of it to Bengal. There grows in Malabar a sort of red areca, which is very proper for dyeing in that color, and which is sent from

time to time to Surat and Amadabat, for the use of the dyers in the dominions of the Grand Mogul.

2. A. oleracea, or true cabbage palm, is the most beautiful, and perhaps the tallest, of all trees. The trunk is perfectly straight, and marked with rings at the vestigiæ of the footstalks of the leaves. Near the ground it is about seven feet in circumference; but tapers as it ascends, and attains the height of 170 or 200 feet. The bark is of an ash color, till within twenty-five or thirty feet of the extremity of the tree; when it alters at once to a deep sea-green, which continues to the top. About five feet from the beginning of the green part upwards, the trunk is surrounded with numerous branches in a circular manner; all the lowermost spreading horizontally with great regularity, and the extremities of many of the higher branches bend wavingly downwards like so many plumes of feathers. These branches, when full grown, are about twenty feet long; and are thickly set on the trunk alternately, rising gradually superior one to another: their broad curved sockets so surround the trunk, that the sight of it whilst among these is lost, which again appears among the uppermost branches, and is there enveloped in an upright green conic spire, which beautifully terminates its great height. The above mentioned branches are somewhat round underneath, and slightly grooved on the upper side: they are likewise decorated with a great number of green pennated leaves; some of these are near three feet long, and an inch and a half broad, growing narrower towards their points, as well as gradually decreasing in length towards the extremities of the branches. The middle rib in each leaf is strong and prominent, supporting it on the under side, the upper appearing smooth and shining. The pithy part of the leaf being scraped off, the inside texture appears to be so many longitudinal thread-like filaments. These, being spun in the same manner as hemp or flax, are used in making cordage of every kind, as well as fishing-nets, which are esteemed stronger than those usually made from other materials. Upon removing the large leaves which surround the top of the trunk, a little way above the beginning of the green bark just mentioned, what is called the cabbage is discovered lying in many thin, snow-white, brittle flakes, in taste resembling an almond, but sweeter. This substance, which cannot be procured without destroying the tree, is boiled, and eaten with mutton by the inhabitants of the West Indies, in the same manner as turnips and cabbage are with us; though it must appear the height of extravagance and luxury to fell so stately a tree, which would be an ornament to the most magnificent palace in Europe, to gratify the taste of any epicure, especially as there is but a very small part of it eatable. What is called the cabbage flower, grows from that part of the tree where the ash-colored trunk joins the green part already described. Its first appearance is a green husky spatha, growing to about twenty inches long, and four broad; the inside being full of small white stringy filaments, full of alternate protuberant knobs, the smallest of these resembling a knotted fringe of coarse white thread: these are very numerous, and take their rise from large footstalks, which are all united to different parts of the large parent stalks. As this husky spatha is opened while young, the farinaceous yellow seed resembling fine saw-dust, is very plentifully dispersed among the stringy filaments, which answer the use of apices in other more regular flowers. These filaments being cleared of this dust, are pickled, and esteemed among the best pickles either in the West Indies or in Europe. But if this spatha is not cut down and opened whilst young, but suffered to continue on the tree till it grows ripe and bursts, the enclosed part, which whilst young and tender is fit for pickling, will by that time have become ligneous, grown bushy, bearing many small leaves; and in time produce a great number of small oval thin-shelled nuts, about the size of unhusked coffee berries: these, being planted, produce young cabbage trees. The sockets, or grooves, formed by the broad part of the footstalks of the branches, are used by the negroes as cradles for their children. On the inner side of the very young footstalks are tender pellicles, of which, when dried, writing paper is made. The trunks serve as gutters; of the pith is made a sort of sago; and the nuts yield oil by decoction. In the pith also, after the trees are felled, a kind of worm, or grub breeds, which is eaten and esteemed a great delicacy by the French of Martinico, St. Domingo, and other islands.

A'RECHE, } Ang.-Sax. arecan, to get, to
A'RAUGHT. } obtain, to reach, to take

For ofte shall a woman haue
Thyng, whiche a man maie not *areche.*
Gower. Con. A. book i.

Otuel, for wrath, anon
Areight him on the cheek bone;
Alltho fell off that was there,
And made his teeth all bare.
Sir Otuel in Ellis, v. ii.

AR'EFY, } Lat. *arefacio*, to make dry;
AREFAC'TION. } from *areo*, to dry, and *facio* to make.

Heat drieth bodies that do easily expire, as parchment, leaves, roots, clay, &c. and so doth time or age *arefy*, as in the same bodies, &c.
Bacon's Natural History.

From them, and their motions, principally proceed *arefaction*, and most of the effects of nature.
Bacon.

ARELAS, ARELATE, or ARELATUM, a town of Gallia Narbonensis, situated on the Rhone, called Arelate Sextonorum, because it had a colony of the sixth legion. According to Ausonius there was a double Arelas, one on each side of the river, and joined by a bridge. That on the left side is thought to have been built by Constantine. It was a favorite place of the Romans, and hence called Gallula Roma. It is now called Arles.

AREM, or AL-AREM (Arab. a dam of water), a mound or dam, which formed a stupendous reservoir above the city Saba, whose eruption caused an inundation.

AREMBERG, a small principality of Germany, lying between Cologne, Juliers, and

Blankenheim, now included in the grand duchy of the Lower Rhine, which belongs to Prussia. It contains 3000 inhabitants, and brings in a revenue of nearly 30,000 florins. The duke of Aremberg formerly possessed many other territories in different parts of Germany and the Netherlands, from which he derived a revenue of £30,000 sterling. The family of Aremberg is descended from the house of Ligne; they were raised to the dignity of princes of the empire by Maximilian II. and to that of duke by Ferdinand III. They had a seat and vote in the diet of the empire, and in the circular diet of the Lower Rhine. The present duke's situation was modified by Bonaparte; the greater part of his territories, however, are in the temporary occupation of other powers.

AREMBERG, or AREMBURG, a capital of the county, seated on the Are, about twenty-six miles south of Cologne, and defended by a castle.

AREMORICA, or ARMORICA; from are moer, *Celt.* i. e. beyond the sea; a port of Gaul, placed by Cæsar and Hirtius between the Sequana and Ligeris. Pliny says that Aquitania was formerly called Aremorica; but in this he is singular. In the lower age, Armorica was confined to Bretagne in France.

ARE'NA, ARENA'CEOUS. } Lat. *arena*, sand; from *areo*, to dry. The arena was the sanded pit of the amphitheatre, left vacant for the conflict of the combatants, and strewed with sand, whence its name.

In the centre of the edifice, the *arena*, a stage was strewed with the finest sand, and successively assumed the most different forms.

Gibbon's History, vol. ii.

A piece of the stone of the same mines, of a yellowish brown color, an *arenaceous* friable substance, and with some white spar mixed with it.

Woodward on Fossils.

ARENA, in anatomy, gravel concreted in the human body.

ARENA, in architecture, the middle of a temple, comprehending the whole space between the antæ and the extreme wall of the building.

ARENACEA, in entomology, a species of phalæna bombyx, found at the Cape of Good Hope.

ARENACUM, or ARENACUS, one of the four towns, or larger villages, in the island of the Batavi, mentioned by Tacitus: now Arnheim, in Gelderland. Lon. 5° 20′ E., lat. 52° 2′ N.

ARENARIA, in entomology, a species of vespa in South America; and a species of formica found in Barbary.

ARENARIA, in botany, sandwort: a genus of the decandria trigynia class; ranking under the twenty-second order, caryophyllei: CAL. five open leaves; petals five, and entire: the capsule is unilocular, and contains many seeds. There are seventeen species, seven of which are natives of Britain, viz. 1. A. laricifolia, larch-leaved sandwort. 2. A. peploides, sea sandwort. 3. A. rubra, purple-flowered sandwort. 4. A. saxatilis, mountain sandwort. 5. A. serpyllifolia, thyme-leaved sandwort. 6. A. tenuifolia, fine-leaved sandwort. 7. A. trinervia, plantain-leaved sandwort.

ARENARIA, in conchology, a species of helix found on the shores of Armenia.

ARENARIA, in ornithology, a bird called in English the scanderling; and in some places, particularly in Cornwall, the curwillet. It is a water-bird, of the long-legged and open-footed kind, and is a little larger than the tringa minor, or sand-piper. These birds are common about the sea-shore, and generally fly in large flocks.

ARENARII, in antiquity, gladiators who combated with beasts in the arena, or amphitheatre. The arenarii were slaves of the lowest rank; and though manumitted were not capable of being Roman citizens, but were ranked with the bestiarii.

ARENARIUM, with ecclesiastical writers, a cemetery or burying-ground. The arenaria were properly a kind of pits or caverns, wherein the primitive Christians held their religious assemblies in times of persecution.

ARENS, or ARENSHARDE, a district of Denmark in the duchy of Sleswick, through which runs the famous wall called Danneuske, which Gottric, king of Denmark, built in the ninth century, across the country from Hollingsted to the Sley (an extent of forty-six miles), as a defence against the inroad of the Saxons and Sclavi. The natives of Arens were the first in the country who professed Christianity; and their church, built in 826, was demolished several times by the idolaters.

ARENSBERG, a town of Germany, the capital of the duchy of Westphalia, seated on the river Roer. Population 2500. Lon. 8° 7′ E., lat. 5° 15′ N.

ARENSBURG, an episcopal and maritime town of Livonia in Sweden, seated in the isle of Osel in the Baltic Sea.

ARENSWALDE, a town of Germany, in the New Marche of Brandenburg, seated on the lake Slauin on the frontiers of Pomerania. Lon. 15° 29′ E., lat. 53° 14′ N

AREOLA, the colored circle around the nipple of the breast.

AREOLATA, in conchology, a species of patella found in the British seas.

AREOPAGUS, a sovereign tribunal at Athens, famous for the justice and impartiality of its decrees, to which the gods themselves are said to have submitted their differences. The court was situated in the town, on a rock or hill opposite to the citadel. The word signifies, strictly, the rock of Mars.

The edifice of the Areopagus was extremely simple; and its roof, which was at first of the most common materials, remained in that state till the time of Augustus. Orestes was the first who thought of embellishing it. He raised in it an altar to Minerva. He likewise adorned it with two seats of solid silver; on one of which the accuser sat, and the accused on the other. Epimenides erected altars here to several allegorical deities, and soon after a temple, which Cicero mentions in his second book of laws. This temple corresponded with that which Orestes had built to the Furies, who brought him to Athens, and procured him the protection of Minerva. Epimenides dedicated it a second

time to the Furies, or severe goddesses, as they were termed by the Athenians. A man was thought lost without resource, and a victim to every human ill, if he enforced a perjury by invoking the sacred name of these tremendous divinities. Some ancient writers suggest that these deities had their temple so near the court Areopagus, that they might enlighten the judges by their inspiration; and, by their continual assistance, prevent them from committing those errors to which human weakness is liable. The senate appointed their priests. Demosthenes had been nominated to preside over their sacrifices; and he thought it very extraordinary, that he, to whom the republic had confided so important an office, should be publicly impeached. It was natural to associate with the Eumenides the other deities who shared with them the sovereign empire over the dead. Epimenides placed in their temples the statues of Pluto, of Mercury, and of Tellus. They were all, according to Pausanias, of an agreeable form. Each of them was placed upon an altar, on which the citizens, or strangers, who had been acquitted by the Areopagus made their grateful offerings. But it was not to gratitude alone that these several deities owed all the incense that smoked upon their altars. They who had been accused before the senate, harassed with superstition, and uncertain how these deities would be affected towards them, were lavish of sacrifice to obtain their clemency, by which they hoped their judges would likewise be influenced. The tomb of Œdipus was another of the ornaments of the Areopagus. It was in the outward court, where a barge was likewise placed, which made a part of the pomp at the public games.

Plutarch attributes the establishment of the Areopagus to Solon: other authors think, with good reason, that this tribunal was instituted before Solon: but the best authorities allow him the honor of its restoration. The city of Athens, governed till this time by tribunals of a circumscribed jurisdiction, which were multiplied by the most trifling accidents and circumstances, took no fixed political or civil form, however closely united the members of those tribunals were by their general views towards the public good, and by the common love of their country. As each of those tribunals could only act in proportion to the power delegated to it, it was impossible that so many different and unequal impressions should give to the great machine of the state that uniform and regular movement which, by an impulse always the same, would keep each part in the situation it should maintain with relation to the whole. To effect this universal and harmonious power, it was necessary to unite the different channels of public authority, which, by being too much distributed, lost its force. This authority Solon collected, and placed it all in the court of Areopagus, which consequently became the main-spring of the government.

The Areopagus assembled in a hall built on the summit of a hill, which was ascended with difficulty by the old men bent with age. However, as for some time they only assembled on the three last days of each month, they bore with patience this inconvenient situation. But public affairs multiplied to such a degree, that they were obliged to add to the three former sittings a fourth, which was held on the seventh day of the month, and which was soon succeeded by an assembly every day. Their meetings were so regular that they were not interrupted by the most solemn festivals, till Cephisodotus was archon; who, in the third year of the 105th olympiad, made a decree, which obliged the Areopagites to celebrate, after the example of other courts, the Apaturian feasts, which lasted five days. This assiduous and painful exercise of their office made the Areopagus feel all the inconvenience of the situation of their tribunal, and determined them to remove it to a part of the city called the Royal Portico. It was a square exposed to all the inclemency of the weather. When the judges, who assembled there in profound silence, had taken their places, they were enclosed by a thread, or rather a cord drawn round them, and are stated to have held their assemblies in the night, that their attention to public affairs might not be diverted by external objects; or, as Lucian adds, that they might only be influenced by the arguments, and not by the presence and action of the speakers. This circumstance explains a passage in Athenæus, who tells us, that none knew the numbers nor faces of the Areopagites. When all the members of the senate were convened a herald enjoined silence, and ordered the people to retire. As soon as they had departed the assembly proceeded to business; and, as they deemed the least preference to be a flagrant injustice, the causes which they were to determine were drawn by a kind of lottery; and the same chance which brought them up distributed them to different numbers of judges, small or great, according to the importance of the several causes. In early times the parties themselves stated their cause in a simple manner. The eloquence of advocates was thought a dangerous talent, fit only to varnish crimes. But afterwards the Areopagites, on this point, relaxed from their severity;—at first the accused, and soon after the accusers, were permitted to engage those to make the attack and the defence whose profession it was to exert the art of speaking, for others, with accuracy and elegance. But it was an inviolable custom of this tribunal to prohibit, in pleadings, all that warm and picturesque oratory which seduces the judgment and inflames the passions. The suffrages were collected in silence. They voted with a small flint, which they held between the thumb and the two next fingers, and which they put into one of the two urns that stood in a corner of the hall. One stood before the other. The first was called the urn of death; the second, the urn of compassion That of death was of brass, and was termed proper; that of compassion was of wood, and was termed improper. The judges commonly brought their flint to the assembly, and put them into the urn; but that all the suffrages might be collected, the herald took the two urns, and presented them, one after another, to every senator, commanding him, in the name of the republic no longer to defer his acquittal or condemnation. The thirty tyrants, to make themselves masters of the de-

cisions of the Areopagus, obliged them to bring their flints publicly, and lay them upon two tables placed before them. The first substances with which they gave their suffrages were not small pieces of the bones of a hog as some authors assert, but sea-shells, for which pieces of brass of the same form, termed spondyla, were afterwards substituted. The substances with which they voted were distinguished by their form and color. Those which condemned were black, and perforated in the middle; the others were white, and not perforated. The precaution of piercing the black ones tends to prove, what we have already observed, that the court of Areopagus sat in the night. The judges were likewise permitted to multiply at pleasure the distinctions between signs, which essentially distinguished the fates of men. After the suffrages were collected, they were taken out of the two urns, and put into a third vase of brass. They were then counted; and as the number of white or of black flints was higher or inferior, one of the judges drew with his nail a shorter or a longer line on a tablet with a waxen surface, on which the result of each cause was marked. The short line expressed acquittal; the long, condemnation. With regard to the emoluments of the judges, they were as moderate as those of the advocates. The length of the process did not enhance its expense; and, when the decision of a cause was postponed till the next day, the committee were only paid an obolus on that day. Hence, Mercury, in Lucian, is surprised that such sensible old men as the senators of Areopagus were, should sell at so low a price the trouble of ascending so high.

As to the number of the judges which composed the Areopagus, some authors attentive only to a part of Solon's regulations, by which he enacted that for the future none but the nine archons should be admitted members of the Areopagus, have imagined that this tribunal was filled anew every year, and that it never consisted of more than nine magistrates. This opinion is refuted by the circumstantial account which Diogenes Laertius gives us of the condemnation of Socrates. That great man had wished to substitute a rational hypothesis, for the fabulous and extravagant system of religion which prevailed in his time. His project, however laudable, appeared impious in the eye of superstition. Information was laid against him before the Areopagus, and he had as many accusers as fellow-citizens. After the charges and the answers were heard, they proceeded to suffrages. The opinions were divided, but not equally, for the number of those who condemned him exceeded by 281 the number of those who declared him innocent. He made an ironical reply to this iniquitous sentence, by telling his judges, that he took it for granted they would admit him to a maintenance in the Prytaneum. On this sarcasm, eighty of those who had voted in his favor forsook him, went over to the opposite party, and condemned him to die. Here then we have 361 judges who condemned him; to whom, if we add those who persisted in acquitting him, the number must be very considerable.

The judges of this court, who, under Draco, decided only in cases of murder, by Solon's regulations took cognizance of crimes of every kind; and the same tribunal which inflicted capital punishment on murder, poisoning, burning of houses, theft, &c. struck at the root of those crimes, by arraigning idleness, luxury, and debauchery. Equally attentive to stimulate the indolence of the young, and the languor of the old, these sage judges roused in the one the laudable ambition to serve the state, and restored to the others their former activity. Satisfied that extremes produce the same effect, they thought the republic had as much to fear from the excess of wealth as from the gripe of poverty; hence they exacted a minute account of the effects of every individual; and hence their great severity to those idle citizens, who, instead of being useful members in a state, are its bane and its dishonor. Isocrates draws a most beautiful and striking picture of these venerable and astonishing men, and the order and harmony which flourished in Athens by their wise administration. The judges of the Areopagus, says he, 'were more industrious to prevent crimes, by representing them in an odious light, than to establish modes of punishment.' It was their opinion that the enemies of the state were the instruments designed by the gods to punish the wicked, but that it was their province to correct and reform public and private manners. They were vigilantly attentive to the conduct of all the citizens, but particularly to that of the youth; and insisted that it was the duty of inspectors of education to soften the austerity of moral discipline with innocent pleasure. The Areopagus divided the city into quarters, and the country into cantons. Every thing passed occasionally under their eyes; and they were acquainted with the private conduct of every citizen. By them the rich were obliged to relieve the poor. Corruption in magistrates was suppressed by the punishments denounced against it; and the old men, at the sight of the employments of the young, felt themselves animated with a degree of juvenile vigor and activity. Religion came likewise under the cognizance of the Areopagites. Plato durst never, as we are told by Justin Martyr, divulge his private opinion concerning the Deity. His dread of the Areopagites, who were attached to the prevailing system, would not permit him even to name those sentiments which opposed the common tradition. The public edifices, the cleanness of the streets, the pay of the soldiers, the distribution of the public money; in a word, whatever interested the republic, was under the direction of the Areopagus. The people themselves, jealous as they were of their power, did nothing without consulting this assembly, and suffered it, without a murmur, to restrain their precipitate measures.

The most important qualifications were required in those who entered into the Areopagus. Solon made a law, by which they who had not been archons for a year should not be admitted members of the Areopagus. To give more force to this law he subjected himself to it, and was only admitted on that title. This was but the first step: the administration of these annual magistrates was investigated; if their conduct was

found irreproachable they were admitted Areopagites with eulogium; but the smallest misconduct excluded them from that honor for ever. Such respect was paid them, that people presumed not to laugh in their presence; and such was their reputation for equity, that those whom they condemned, or dismissed without granting their petition, never complained that they had been unjustly treated.

Of all the judgments of the Areopagus, the most famous one, excepting that of Mars, was the sentence said to have been passed on Orestes. His trial, which happened under Demophoon the twelfth king of Athens, in 375 of the Attic era, owed all its fame to a remarkable circumstance, that gave rise to a custom which was observed ever afterwards. Orestes had killed his mother. He was accused before the Areopagus, and cited to appear in that court. He would have lost his life in consequence of the equal division of the votes, had not Minerva, moved with his misfortunes, declared herself for those who had absolved him, and joined her suffrages to theirs! Thus Orestes was saved. In veneration of this miracle, the Areopagites, whenever the suffrages were equally divided, decided in favor of the accused, by granting him what they termed 'the shell of Minerva.' Cephalus and Dædalus were condemned by the Areopagus long before the time of Orestes. We find in ancient authors some decisions of this tribunal, which bear the strongest marks of justice, though their objects are not interesting. There is a singular anecdote in Aulus Gellius, and Valerius Maximus, of a woman who was accused of having poisoned her husband and her son. She was taken and brought before Dolabella, who was then proconsul of Asia, and no sooner was in his presence than she owned the fact; and added, that she had very good reasons for putting her husband and her son to death:—'I had,' said she, 'by my first husband a son whom I tenderly loved, and whose virtues rendered him worthy of my affection. My second husband, and the son whom I bare to him, murdered my favorite child. I thought it would have been unjust to have suffered those two monsters of barbarity to live. If you think, Sir, that I have committed a crime, it is your province to punish it: I certainly shall never repent of it.' This affair embarrassed Dolabella. She was afterwards sent to the Areopagus; and that court, when they had examined her a long time, ordered her and her accuser to appear before them again a hundred years after, from the first day of her trial. We must not, however, suppose that the Areopagus always preserved its reputation. Pericles, who lived about 100 years after Solon, to flatter the people and win them to his party, used his utmost efforts to weaken its authority. He took from it the cognizance of many affairs which had before come under its jurisdiction; and, to forward his design of humbling it, employed the eloquence of Ephialtes, whose talents were formidable, and who was an avowed enemy to the great men of Athens. The Areopagus itself seemed to second the endeavours of a man who projected its ruin, and by its own misconduct hastened its fall. The old rules of the court, by which none were admitted its members but those whose unexceptionable conduct would support its majesty, were pronounced too severe. They grew less delicate in their choice; and presuming that the faults with which they dispensed would soon be reformed in the society of so many good examples, vice imperceptibly crept in among them: corruption, at first secret and timid, grew insensibly open and daring, and made such progress that the most shameful crimes were soon exhibited on the stage; copied not from the low and abandoned multitude, but from those senators once the venerable and austere censors of idleness and of vice. Demetrius, the comic poet, wrote a piece which he entitled The Areopagite, where he strips the mask off those hypocritical legislators, who were now equally apt to be seduced by wealth and by beauty. So much had the Athenian senate degenerated in the days of Isocrates, about 340 years before the Christian era. Before this tribunal St. Paul was called to give an account of his doctrine, and converted Dionysius one of their number. The end of this court of judicature is as obscure as its origin, which was derived from very remote antiquity. It existed, with the other magistracies, in the time of Pausanias, i. e. in the second century. The term of its subsequent duration is not ascertained; but a writer who lived under the emperors Theodosius the elder and younger, in the fifth century, mentions it as extinct.

AREOTECTONICS, that part of fortification which teaches to attack an enemy safely and fight advantageously.

AREQUIBA, or AREQUIPA, a city of South America, one of the largest and most beautiful cities in Peru, situated in the valley of Quilca, 217 leagues south-east from Lima, and 20 from the sea, with which it communicates by the river Chili. The entrance into the harbour is rather shallow for ships of great burden; but when once they are entered, they may ride securely in eighteen fathoms water. This city was founded in 1539, by order of Don Francisco Pizarro, in a place known likewise by the name of Arequiba. The houses are built of stone, and vaulted; they are lofty, neatly furnished within, and finely decorated on the outside. The inhabitants also are exempt from many diseases common in other parts of Peru, owing to their keeping the streets clean by means of canals which extend to the river. The temperature of the air is extremely good; and, though sometimes a slight frost is perceivable, the cold is never excessive, nor the heat troublesome, so that the surrounding fields are clothed with perpetual verdure. These natural advantages, however, are considerably allayed by its being very subject to earthquakes, by which it has been often laid in ruins. Population 40,000. Long. 71° 58′ W., lat. 16° 15′ S.

ARERE. Ang.-Sax. arærran, to rear or raise up, to erect, to incite.

> The day is miri, and draweth long
> The lark *arereth* her song;
> To meed goth the damisele,
> And faire flowers gadreth fele.
>
> *Merlin, in Ellis*, vol. i.

ARES, a term framed by Paracelsus, to express a hidden disposer in the three principles of things, from which each being receives its proper form and substance, and assumes its own specific nature, not that of any other being. Paracelsus distinguishes the ares into archeical, which is natural; and chemical, which is artificial.

ARESKOUI, the god of war among the American Indians.

ARESON. Fr. *arraisoner*, to reason with.

> As the kyng rod wyth duykes and earlis,
> He mette with two old cheorlis.
> To the navel theo berd heng:
> Thus *aresoned* heom the kyng.
>
> *King Alisaunder, in Ellis*, vol. i.

ARETÆUS of Cappadocia, a Greek physician, of the sect of the Pneumatists, lived in the reign of Augustus, according to some; according to others, under Trajan or Adrian. He wrote several treatises in the Ionian dialect on acute diseases, and other medicinal subjects; some of which are still extant. The best edition of his works is that of Boerhaave, in Greek and Latin, with notes, printed in 1731; that of Wigan, printed at Oxford in 1723, in folio, is also much esteemed.

ARETAPHILA of Cyrene, the wife of Melanippus, a priest of that place, whom Nicocrates murdered for the sake of Aretaphila. The tyrant, suspecting that she designed to poison him, put her also to the rack to extort a confession, and afterwards begged her forgiveness. She, however, managed matters so as to procure his death; and ordered his brother, whom she married, to be thrown into the sea.

ARETHUSA, in botany, a genus of the gynandria diandria class; natural order, seventh, orchideæ. The generic character is taken from the nectarium, which is tubular, situated at the bottom of the corolla, and the inferior labium fixed to the stylus. The species are: 1. A. bulbosa, bulbous arethusa, found in Virginia and Canada. 2. A. Capensis, Cape Arethusa, discovered by Thunberg at the Cape of Good Hope. 3. A. villosa, villose arethusa, also a native of the Cape of Good Hope. 4. A. biplumata, two-feathered arethusa, a native of North America.

ARETHUSA, in entomology, a species of papilio, the papilio nymphalis of Gmelin, found in Germany and Prussia.

ARETHUSA, in fabulous history, the daughter of Nereus and Doris, and the companion of Diana, who changed her into a fountain to deliver her from the pursuit of her lover Alpheus.

ARETHUSA, in geography, a celebrated fountain near the city of Syracuse in Sicily, famous for the quantity of its waters, and the number of fishes it contained. Many fables were invented by the ancients concerning this fountain. They had a notion that the river Alpheus runs under or through the waters of the sea, without mixing with them, from Peloponnesus to Sicily. Mr. Brydone informs us that it still continues to send forth an immense quantity of water, rising at once to the size of a river, but is entirely abandoned by the fishes it formerly contained in such plenty. At some distance from Arethusa is a fountain of fresh water which boils up very strongly in the sea, insomuch that, after piercing the salt water, it may be sometimes taken up very little affected by it. This fountain Mr. Brydone thinks the ancients were ignorant of, or they would not have failed to use it as an argument for the submarine journey of Alpheus. Mr. Swinburne describes this once famous fountain as a large pool of water near the quay, defended from the sea by a wall, and almost hidden by houses on every other side. The water is not salt, but brackish, and fit for no purpose but washing linen. 'This,' says he, 'is the celebrated fountain of Arethusa, whose soft poetical name is known to every reader. The fable of the nymph and her constant lover Alpheus, the excellence of the spring, and the charms of its situation, are themes on which ancient and modern poets have indulged their fancy, and exercised their pens. Alas, how altered! rubbish chokes up its wholesome sources; the waves have found a passage through the rocks, which repeated earthquakes have split; and not a fish is to be seen in it. Sometimes after an earthquake, it has been left dry; and at other times the whole mass of its waters have been tainted by subterraneous effluvia. Its fountain-head probably lies among the neighbouring hills.'

ARETIA, in botany, a genus of the class pentandria, order monogynia; natural order, twenty-first, preciæ: COR. divided into five parts; the tube ovated: the capsule globular, and consisting of but one cell. The species are three: viz. A. alpina, alpine aretia. 2. A. helvetica, imbricated aretia. 3. A. vitaliana, grassy aretia; all natives of the Alps.

ARETINO (Francis), a celebrated critic on the Greek language. He translated into Latin the Commentaries of St. Chrysostom upon St. John, and about twenty Homilies of the same father; also the Letters of Phalaris; and wrote a treatise De Balneis Puteolanis. He studied at Sienna, about 1443; and afterwards became a teacher of civil law. He displayed his talents chiefly in disputes, in which nobody could withstand him. He gave his opinions in law with so much confidence as to assure those who consulted him that they should carry their cause: nor did experience contradict him; for it was a common saying at the bar, such a cause has been condemned by Aretin, it must therefore be lost. He taught also in the universities of Pisa and Ferrara. He was at Rome under the pontificate of Sixtus IV. but soon perceived that the great hopes which he had built upon his reputation would come to nothing. This pope, however, declared he would have given him a cardinal's hat, had he not thought he should have done a public injury by depriving the youth of such an excellent professor. When old age would not permit him to go through the duties of his office, they dispensed with his reading of lectures, and his salary was continued. He continued, however, sometimes to mount the chair; and, one day, when the students were gone to some public shows, there were but forty persons in his auditory; which so mortified him, that he threw away his book; and crying out, 'Aretin shall never explain law to a few persons,' retired in a passion, and would teach no more. He was severe

in his temper, and never kept a servant longer than a month or two; for it was a maxim of his, 'That new hired servants always serve best.' He was honored with the title of knight, and spent all his life in celibacy; and his way of living was so parsimonious that he amassed a great deal of wealth. He had designed this wealth for the maintenance of a college; but he altered his resolution, and left it to his relations.

ARETINO (Guido), a celebrated musician, born at Arezzo in Tuscany, in the thirteenth century. Having been taught music in his youth, and probably retained as a chorister in the service of the Benedictine monastery in that city, he became a brother of the order of St. Benedict. In this retirement he seems to have devoted himself to the study of music, particularly the system of the ancients, and, above all, to reform their method of notation. The difficulties that attended the instruction of youth in the church offices were so great, that ten years were generally consumed barely in acquiring the knowledge of the plain song; and this consideration induced him to labor after some method that might facilitate instruction, and enable those employed in the choral office to perform the duties of it in a correct manner. Being at vespers in the chapel of his monastery, it happened that one of the offices appointed for that day was the hymn of St. John, composed by Paul, a deacon of the church of Aquileia, about A. D. 770.

UT queant laxis . . . REsonare fibris
MIra gestorum . . . FAmuli tuorum
SOLve pollutis . . . LAbiis reatum.
Sancte Joannes.

During the performance he remarked the iteration of the words, and the frequent returns of UT, RE, MI, FA, SOL, LA, and immediately conceived a thought of applying these six syllables to perfect an improvement either then actually made by him, or under consideration, viz. that of converting the ancient tetrachords into hexachords. His interest with the abbot, and his employment in the chapel, gave him an opportunity of trying the efficacy of this method on the boys who were training up for the choral service, and it exceeded his most sanguine expectation. The fame of Guido's invention soon spread abroad, and his method of instruction was adopted by the clergy of other countries. John XX. or as some writers style him, the XIX. pope of that name, having heard of the fame of Guido, and desiring to see him, sent three messengers to invite him to Rome; upon their arrival, it was resolved by the brethren of the monastery, that he should be attended by Grimaldo the abbot, and Peter the chief of the canons of the church of Arezzo. Arriving at Rome he was received with great kindness: the pope had several conversations with him, in which he interrogated him as to his knowledge in music; and upon sight of an antiphonary which Guido had brought with him, marked with the syllables agreeable to his new invention, the pope would not stir from his seat till he had learned perfectly to sing off a verse; upon which he declared that he could not have believed the efficacy of the method, if he had not been convinced by the experiment he had himself made of it. The pope would have detained him at Rome, but laboring under a bodily disorder, and fearing an injury to his health from the air of the place, and the heats of the summer then approaching, Guido left that city upon a promise to revisit it, and explain to his holiness the principles of his new system. On his return homewards he made a visit to the abbot of Pomposa, a town in the duchy of Ferrara, who was anxious that he should settle in the monastery of that place; which invitation he accepted, and it was here that he composed a tract on music, intitled Micrologus, i. e. a short discourse; which he dedicated to Theodald bishop of Arezzo. Martini cites several manuscripts of Guido; viz. two in the Ambrosian library at Milan, the one written about the twelfth century, the other less ancient: another among the archives of the chapter of Pistoja, a city in Tuscany, and a fourth in the Mediceo-Laurenziano library at Florence, of the fifteenth century. These are clearly copies of the Micrologus. Of the epistle to Michael, with the Argumentum novi Cantus, he mentions only one, which he says is somewhere at Ratisbon. Of the several tracts above mentioned, the last excepted, a manuscript is extant in the library of Balliol college in Oxford. Several fragments of the two first in one volume, are also among the Harleian manuscripts now in British Museum, No. 3199; but so much mutilated, that they afford but small satisfaction to a curious enquirer.

ARETINO (Leonard), one of the most learned men of the fifteenth century, was secretary to the republic of Florence, and translated from the Greek into Latin some of Plutarch's Lives, and Aristotle's Ethics: he also composed three books of the Punic war, as a supplement to those wanting in Livy; the history of the transactions in Italy during his time; that of ancient Greece; that of the Goths; that of the republic of Florence; and many other books. He died in 1443, aged seventy-four.

ARETINO (Peter), a native of Arezzo, who lived in the sixteenth century. He was famous for his satirical writings; and was so bold as to carry his invectives even against sovereigns, and thus obtained the title of the scourge of princes. Francis I., the emperor Charles V., most of the princes of Italy, several cardinals, and many noblemen courted his friendship by presents, either because they liked his compositions, or perhaps from an apprehension of falling under the lash of his satire. Aretino became thereupon so insolent, that he is said to have got a medal struck, on one side of which he is represented with these words, IL DIVINO ARETINO; and on the reverse, sitting upon a throne, receiving the presents of princes with these words, I PRINCIPI TRIBUTATI DA POPOLI, TRIBUTANO IL SERVIDOR LORO. He used to boast, that his lampoons did more service to the world than sermons; and it was said of him, that he had subjected more princes by his pen than the greatest heroes had ever done by their arms. Aretino, however, wrote many irreligious and obscene pieces. Strange to say, while engaged in these licentious productions, he was also writing the lives of St. Thomas of Aquinas, and of St. Catherine of Sienna, and composing penitential

nymns and other pieces of devotion. Aretino died at Venice in 1556, aged sixty-five years. In an epitaph written for him by an Italian wit, it is observed, 'that he satirised every one except his Maker, whom he spared only because he did not know him.'

ARETOLOGI, in antiquity, a sect of philosophers, chiefly of the Cynic or Stoic tribe, who, having no school or disciples of their own, haunted the tables of great men, and entertained them in their banquets with disputations on virtue, vice, and other popular topics.

AREZZO, anciently Aretium, a city of Italy, in Tuscany, seated in the territory of Florence, on the declivity of a mountain in the middle of a fruitful plain, seventeen miles from Citta di Castello, and lying between it and Florence. It is an ancient city and bishop's see; and was famous for a kind of earthenware much esteemed by the Romans. It was greatly fallen to decay when Cosmo de Medicis took it under his protection; since which it has been recovering gradually. It was the birth-place of Mecænas and of Petrarch. It is now a bishop's see, and contains 8,000 inhabitants.

ARGAL, crude tartar, in the state in which it is taken out of empty wine vessels.

ARGEA, or ARGEI, in Roman antiquity, thirty human figures, made of rushes, thrown annually by the priests, or vestals, into the Tiber, on the day of the ides of May. Plutarch, in his Roman Questions, inquires why they were called Argea. Two reasons are assigned: viz. 1. That the barbarous nations who first inhabited these parts, cast all the Greeks they could meet with into the Tiber; for Argians was a common name for all Grecians; but that Hercules persuaded them to quit so inhuman a practice, and to purge themselves of the crime by instituting this solemnity. 2. That Evander, an Arcadian, and a sworn enemy of the Argians, to perpetuate that enmity to his posterity, ordered the figures of Argians to be thus cast into the river.

ARGEIA, or ARGOLIS, a district of Peloponnesus, situated between Arcadia on the west, the Ægean Sea on the east, Laconia and the Sinus Argolicus on the south, and the territory of Corinth and the Sinus Saronicus on the north; so called from Argos, the capital: now Romania di Morea.

ARGEII, or ARGIVI, the Argives, inhabitants of Argia. They were a colony who migrated, it is said, from Egypt, under the command of Inachus. Polemon and Ptolemy Mendesius, ancient Greek writers, inform us that Inachus was contemporary with Amosis, who demolished Avaris, and expelled the shepherds out of Egypt. If, with some learned chronologers, we suppose Inachus to have begun to reform the Argives, A. A. C. 1856, and to have died A. A. C. 1808, he must have been coeval with Amosis, who reigned in Upper Egypt fifteen years before the expulsion of the shepherds, and ten years after that event, which happened A. A. C. 1806. Inachus was styled the Son of the Ocean, because of his unknown origin, or because he had come by sea into Greece. Before his arrival the inhabitants were rude and barbarous. These he united and civilised, and instructed in various arts. His son Phoroneus instituted the laws of government; and, on that account, has been called the first king of Argos, the first of men, and the father of mortals. The family of Inachus, after having kept possession of the throne 347 years, were expelled by Danaus, who arrived A. A. C. 1509, with a colony from Canaan. Acrisius, the last king of Argos, died A. A. C. 1313; and was succeeded by Perseus his grandson, who transferred the seat of government to Mycenæ, 544 years from the first year of Inachus, in the reign of Cecrops II. king of Athens, and about the time when Pelops the son of Tantalus king of Phrygia, having been compelled by Ilus to leave his native country, came into Greece with great wealth, and acquired supreme power in the region afterwards called by his name. In the thirty-seventh year of Eurystheus, grandson of Perseus, the Argonautic expedition happened, A. A. C. 1224. This unjust and tyrannical prince had assigned to Hercules his tasks; and, after the death of that hero, he banished all his children. These were the Heraclidæ who fled to Athens for protection, and who returned to Peloponnesus forty years after the destruction of Troy. In the reign of Agamemnon the Trojan war commenced; and it was carried on with vigor, during the space of ten years. In A. A. C. 1184, Troy was taken and the war was concluded. Scarcely had the Grecians settled in their own country, after their return from this dangerous expedition, when the posterity of Hercules invaded Peloponnesus, took possession of it, and divided it among themselves. Here the kingdom of Mycenæ ended, and that of Sparta was established on its ruins. See SPARTA.

ARGEMA, or ARGEMON, in medicine, an ulcer about the iris of the eye, comprehending part of the white, and part also of the black. The argemon appears of a red color on the outside of the iris, and white within it. When it spreads far, and eats deep, it sometimes occasions the uvea to fall.

ARGEMONE, prickly poppy: a genus of the monogynia order and polyandria class of plants; natural order, twenty-seventh, rahœadeæ: COR. six petals: CAL. is tryphyllous: CAPS. semivalved. Of this genus there are three species, which are common in many parts of the West Indies, and called by the Spaniards the devil's fig; but they are of no use, and have very little beauty.

ARGEMONION, in botany, a name given by some of the late Greek writers, to the plant called sarcocolla by the other writers of their times.

ARGENCES, a town of France, in the department of Calvados, ten miles east of Caen, seated on the Meance. Lon. 0° 10′ W., lat, 49° 15′ N.

AR'GENT, AR'GENTINE, AR'GENTRY. } Lat. *argentum*, silver, Gr. *αργυρον*, so called on account of *το αργον*, the whiteness Silvery, having the appearance of silver.

Rinaldo flings
As swift, as fiery lightning kindled new:
His *argent* eagle, with her silver wings
In field of azure, fair Erminia knew. *Fairfax.*
In an *argent* field, the god of war
Was drawn triumphant on his ivory car. *Dryden.*

Those *argent* fields more likely habitants,
Translated saints, or middle spirits, hold,
Betwixt th' angelical and human kind. *Milton.*

Or ask of yonder *argent* fields above,
Why Jove's satellites are less than Jove? *Pope.*

Amid the lustre of meridian day,
In slow procession, solemnly advance
A hundred youths in spotless tunics white,
Sustaining *argent* wands. *Glover's Athenaid.*

ARGENT, in heraldry, denotes the white color marked in the coats of arms of baronets, knights, and gentlemen; in the coat of a sovereign the white color is called luna; the arms of the nobility, pearl. It is marked in painting by leaving the field entirely blank, as in the annexed figure.

ARGENTAC, a town of France, in the department of Upper Vienne, seated on the Dordogne, twelve miles south-east of Tulles.

ARGENTAN, a town of France, in the department of Orne, seated on an eminence in the middle of a fertile plain, on the banks of the Orne. It carries on a considerable trade in corn, fine linen, lawns, gauzes, hats, leather, &c. It is situated twelve miles north-west of Seez, and 110 west of Paris. Lon. 0° 5′ E., lat. 48° 54′ N.

ARGENTANGINA, the silver quinsy; when a lawyer, being feed by both parties, pretends, while pleading at the bar, to be suddenly taken ill, in order to favor his client's opponent.

ARGENTARIA, a town of ancient Gaul, supposed to have been situated where Colmar now stands. It is remarkable for a great victory gained by the emperor Gratian over the Lentienses in May A. D. 378. The Romans being but few in number were at first overpowered, and obliged to give ground; but soon returning to the charge, they gained in the end a complete victory; thirty thousand barbarians, with their king Triarius, being killed on the spot.

ARGENTARIA CRETA, silver chalk, in natural history, a very beautiful earth, of a loose friable texture, and perfectly white. It is not properly a chalk, but a species of tripela, dug in Prussia, and is much esteemed for cleaning plate. It has also been found in France, and of late in Ireland. The species dug at Mantua is much used by painters, and at Rome is vulgarly called gesso.

ARGENTARIUS, in civil law, one who adorned military arms with silver or gold.

ARGENTARIUS, in Roman antiquity, a money-changer or banker. The argentarii were monied people, who made a profit either by the changing, or lending of money at interest. They had their tabernæ, or offices, in the Forum Romanum as early as the reign of Tarquin I. The argentarii and fœneratores were hated for their covetousness and extortion.

ARGENTARIUS, in writers of the middle age, an officer entrusted with the custody of money. In this sense argentarius amounts to the same with the Greek αργυροφυλαξ, and our cashier.

ARGENTARIUS MILES, in our old writers, an officer of the exchequer, whose business it was to carry up the bag of money from the lower exchequer to the higher, in order to its being examined or told.

ARGENTARO MONTE, a cape and promontory of Italy, on the coast of Tuscany, twelve miles south of Orbitello. It juts out into the sea like a peninsula, and is a useful landmark.

ARGENTATI MILITES, in antiquity, and mentioned by Livy, lib. vi. are distinguished from aurati. Aquinas supposes these to have been similar to the argyraspides and chrysalpides; but the descriptions do not agree. Livy only represents the argentati as clothed in white linen coats.

ARGENTEUIL, a town of the Isle of France, seated on the Seine, five miles north-west of Paris. It is a beautiful place, with fine vineyards. In the environs are quarries of stucco. In the ci-devant Benedictine priory, they pretend to have the seamless coat of Christ. Lon. 2° 28′ E., lat. 48° 52′ N.

ARGENTEUS CODEX, a MS. copy of the four gospels, so named from its silver letters. The leaves are parchment, violet-colored, and on this ground the letters, which are all capitals, have been painted in silver, except the initials, and a few passages in gold. It is supposed to be a copy of the Gothic version, made by Ulphilas the apostle of the Goths, in the fourth century. It is now in the university of Upsal. It is a 4to. size. 'I was convinced,' says Mr. Archdeacon Coxe, 'from a close inspection, that each letter was painted, and not formed, as some authors have asserted, by a hot iron upon leaves of gold and silver. Most of the silver characters were become green by time; but the golden letters are still in good preservation. The codex is mutilated in several places; but what remains is, for the most part, perfectly legible.

'This manuscript was, in 1597, first discovered in the library of the Benedictine abbey of Werder in Westphalia, by Anthony Marilion, who extracted a few passages, which were inserted in a commentary on the Gothic alphabet, published by Bonaventura Vulcanius. Soon afterwards Arnold Mercator observed it in the same library; and transcribed a few verses, which Gruter gave to the world in his Inscriptiones Antiquæ. From the abbey of Werder it was transferred to Prague, during the short period in which that town was occupied by Frederic, Elector Palatine. At the capture of Prague in 1648, it was found among the literary spoils by Count Konigsmark, and sent as a most valuable present to Christina. The queen is said to have given it to Isaac Vossius; but most probably the crafty Dutchman took it without permission, among many other rare books and manuscripts, when he pillaged her majesty's library during the confusion which preceded her abdication. On the death of Vossius it was purchased by Count Magnus Gabriel de la Gardie for £250, and presented to the university of Upsala.'—*Coxe's Travels in Poland, Russia, Sweden, and Denmark.*

ARGENTICOMUS, among ancient astrologers, denotes a kind of silver-haired comet of uncommon lustre, supposed to be the cause of great changes in the planetary system.

ARGENTIERA, or ARGENTIERE, a small island in the Archipelago, near Milo, so named from its silver mines. It is about eighteen miles in circumference, full of barren mountains, producing nothing but barley, cotton, and a few grapes fit only for eating. The barley and cotton are sown round the only village in the island. The men all frequent the sea, and in time become good pilots. They have little religion, and are very ignorant. Justice is administered by an itinerant cadi, who is sometimes the only mussulman in the whole island. It produces the Terra Cimolia, so highly esteemed by the ancients. See CIMOLIA.

ARGENTIERE, a town of France, in the department of Ardeche, five miles south-west of Aubenas, and twenty-one west of Viviers. Population 2000.

ARGENTIL, an old English name for the plant called percipier Anglorum; in English, parsley piert, or parsley break-stone. See APHANES.

ARGENTINA, in botany, a medicinal plant, nearly resembling cinquefoil, of some use as a cooler and astringent.

ARGENTINA, in ichthyology, a genus of fishes belonging to the order of abdominales. The generic characters are these: the teeth are in the tongue as well as the jaws; the bronchiostege membrane has eight radii or rays; the anus is near the tail; and the belly fins consist of many rays. There are two species of argentina, viz. 1. A. carolina has fifteen rays in the fin near the anus; the tail is forked, and the lateral lines are straight. It inhabits the fresh waters of Carolina. 2. A. sphyræna has likewise fifteen rays in the fin at the anus; the air bladder of this species is conical on both sides, and shines like silver: false pearls are sometimes made of it.

ARGENTINUS, a deity worshipped by the ancients as the god of silver coin; as Æsculanus, whom they made his father, was the god of brass money, which was in use before silver.

ARGENTON, a town of France in the department of the Indre. It is divided into two by the river Creuse. It had formerly a castle; but that was demolished by Louis XIV. Population 3400. Lon. 1° 25′ E., lat. 46° 36′ N.

ARGENTORA, ARGENTORATUM, or ARGENTORATUS, an ancient city of the Tribocci, called also Argentina. It was one of the fifty forts built by Drusus on the Rhine. The name was formed by the Romans from the German Argen Strassen, or Straten, 'unsafe roads for travellers,' from the marauding parties of the garrisons that infested the roads. It is now called Strasburg.

ARGENTRE (Charles Duplessis d'), a learned French prelate, was born in 1673. By his labors and learning he became doctor of the Sorbonne, almoner to the king, and bishop of Tulles. Among his numerous works, the most interesting is, his Collectio Judiciorum de novis Erroribus, in three volumes folio; containing nearly the same materials as Bossuet's large work, L'Histoire des Variations. Argentre died in 1740.

ARGENTUM ALBUM, silver coin, or pieces of bullion that anciently passed for money. By doomsday tenure some rents to the king were paid in argento albo, common silver pieces of money; other rents, in libris ursis et pensatis, in metal of full weight and purity: in the next age, that rent which was paid in money, was called blanch fearm, and afterwards white rent; and what was paid in provisions was termed black mail.

ARGENTUM DEI, GOD'S PENNY, anciently signified earnest-money, or money given to bind a bargain; in some places called erles, or arles, and by the civilians and canonists arrhæ.

ARGENTUM MOSAICUM, or ARGENTUM MUSIVUM, a mass consisting of silver-like flakes, used for the coloring of plaster figures, and for other purposes, as pigment. It consists of an amalgam of equal parts of tin, bismuth, and mercury. It is to be mixed with white of eggs, or spirit varnish, and then applied to the intended work, which is afterwards to be burnished.

ARGENTUM VIVUM, mercury or quicksilver. See MERCURY.

ARGENVILLE (Anthony Jos. Dezallier d'), an ingenious French writer, was the son of a bookseller in Paris. He became a member of several societies in Europe. He was author of a treatise on Gardening, 4to. 1747; the Lives of the most famous Painters, 4to. 1755; a Catalogue of Fossils found in France; and other curious works. He also wrote for the Encyclopedie. He died in 1766.

ARGESTES is used by Vitruvius for the wind which blows from that quarter of the horizon, which is 75° from the south, and westward. Ricciolus uses the term to denote the wind which blows at 22° 30′ from the west towards the north, coinciding with that which is commonly called west-north-west.

ARGETENAR, in astronomy, a star of the fourth magnitude, in the flexure of the constellation Eridanus.

ARGIA, in mythology, 1. the wife of Inachus, and mother of Io, or Isis; 2. the daughter of Adrastus, wife of Polynices, and mother of Thersander, one of the Epigoni; 3. the mother of Argus, the carpenter of the ship Argo.

ARGIA, in entomology, a species of papilio. This is a native of Sierra Leone in Africa; and is figured by Cramer under the name of cassiopea.

AR'GIL, ARGILLA'CEOUS, ARGIL'LOUS. } Gr. Αργιλλος, a white pure earth, from αργος, white.

Argill is that part of clay to which this owes its property of feeling soft and unctuous, and of hardening in fire; it is difficultly soluble in acids, and scarce ever effervesces with them. When combined with the vitriolick acid, it forms alum.

Kirwan's Manures, p. 6

Clayey loam denotes a compound soil, moderately cohesive, in which the *argillaceous* ingredient predominates. *Id.* p. 9.

Albuquerque derives this redness from the sand and *argillous* earth at the bottom. *Brown's Vulgar Errors.*

ARGIL, in ornithology, a species of ardea.

ARGILLACEOUS EARTHS, such as form with water a tenacious paste, or soft stones; they burn hard, are corroded by strong coction in the concentrated mineral acids, but not acted upon by moderate digestion. They are the basis

of earthenwares. They vitrify with salts, with arsenic, with gypsum, and difficultly with lead.

ARGIVI, a name for the Greeks in general.

ARGO, in fabulous history, the ship celebrated by the poets wherein the Argonauts, of whom Jason was the chief, sailed in quest of the golden fleece. Jason having happily accomplished his enterprise, consecrated the ship Argo to Neptune; or, as others say, to Minerva, in the isthmus of Corinth; where, they add, it did not remain long before it was translated into heaven, and made a constellation. The generality of authors represent the ship Argo as of a long make, resembling the modern galleys; and furnished with thirty benches of rowers. It could not, however, be of any great bulk, since the Argonauts were able to carry it from the Danube to the Adriatic sea. See ARGONAUTS.

ARGO, or ARGO NAVIS, in astronomy, the ship Argo, is a constellation in the southern hemisphere, whose stars in Ptolemy's catalogue are forty-five; in Tycho's eleven; in the Britannic Catalogue, and Sharp's Appendix, sixty-four.

ARGOB, in ancient geography, a canton lying beyond Jordan, in the half tribe of Manasseh, and in the country of Bashan, one of the most fruitful on the other side of Jordan. In the region of Argob there were sixty cities, called Bashan-havoth-jair, which had very high walls and strong gates, without reckoning many villages and hamlets which were not enclosed; Deut. iii. 4. 14. and 1 Kings iv. 13. The capital city of the region of Argob, which, according to Eusebius, was fifteen miles west from Gerasa.

ARGOLI (Andrew), an Italian mathematician, was born at Tagliacozzo in the kingdom of Naples. In 1636 the senate of Venice appointed him professor of mathematics at Padua, with the title of chevalier. He died in 1653. He published a treatise De Diebus Criticis, in 4to. 1652; and Ephemerides, from 1640 to 1700.

ARGOLI (John), son of the above, was professor of jurisprudence at Bologna. He wrote a poem, which is much admired, entitled, Endymion. He died about 1660.

ARGONAUTA, the name of a species of shell-fish belonging to the order of vermes testacea. The shell consists of one spiral involuted valve. There are two species: viz. 1. A. argo, with a subdented carina, is found in the Mediterranean and Indian Oceans. This is the famous nautilus of Pliny. The shell seems no thicker nor stronger than a piece of paper; and the fish that inhabits it is a sepia. When it is to sail, it extends two of its arms on high; and between these supports a membrane, which it throws out on this occasion: this serves it for a sail; and the two arms it hangs out of the shell, to serve occasionally either as oars or as a steerage; but this last office is generally served by the tail. When the sea is calm it is common to see numbers of these creatures diverting themselves with sailing about in this manner; but as soon as a storm rises, or any thing gives them disturbance, they draw in their legs, and take in as much water as makes them somewhat heavier than the sea-water in which they swim, and they then sink to the bottom. The manner of their voiding this abundant water, when they would rise again, is by a number of holes, of which their legs are full. 2. A. cymbium has a blunt plaited carina. This species is very small, and is found in the Mediterranean.

ARGONAUTIC, something belonging to the Argonauts. The argonautic expedition is one of the great epochas, or periods, of ancient history, which Sir Isaac Newton endeavours to settle, and from thence to rectify the ancient chronology. This he shows, by several authorities, to have been one generation, or about thirty years, earlier than the taking of Troy, and forty-three years later than the death of Solomon. See CHRONOLOGY. Dr. Bryant, however, rejects the history of the Argonautic expedition as a Grecian fable, founded on a tradition derived from Egypt, and ultimately referring to Noah's preservation, &c. in the ark. But although we are not to believe all the romantic stories which poets, and even some grave historians, have told us of those famous adventurers, yet it seems unreasonable to discredit entirely the Argonautic expedition. See ARGONAUTS.

ARGONAUTICA, in literary history, poems on the expedition of the Argonauts. We have the Argonautics of Orpheus in epic verse, published by H. Stephens; the Argonautics of Apollonius Rhodius, an heroic poem, consisting of four books, 'a work,' as Quintilian says, 'by no means contemptible;' and the Argonauticon of Valerius Flaccus, in eight books of Latin heroics, in imitation of Apollonius; with respect to which Burmann observes, that the imitator has often surpassed the original.

ARGONAUTS, in antiquity, a company of fifty-one heroes, according to Valerius Flaccus, or, according to Apollonius Rhodius, of forty-four, who embarked along with Jason in the ship Argo, for Colchis, to obtain the golden fleece: but Julius Hyginus, who gives a list of them with their genealogies, enumerates no fewer than sixty-nine Argonauts. Hercules, Theseus, Castor, Pollux, Amphion, Telamon, Meleager, &c. were of the number. Calais and Zethes, the sons of Boreas, who were said to have had wings at their head and feet, were their pilots. Jason, according to the fable, before he could obtain the golden fleece, had to engage its guardians—a monstrous dragon, and two bulls with brazen feet, which breathed fire from their nostrils; all which prodigies he performed by the help of Medea, daughter of Æetes king of Colchis, and carried off both the fleece and the princess. The occasion of this expedition is thus represented by Greek writers: Phryxus, flying with his sister Helle from the rage of their step-mother Ino, the daughter of Cadmus, went on board a ship whose ensign was a golden ram, and sailed to Colchis, now Mingrelia, part of Georgia. Helle was drowned by the way in that sea, which from her was called the Hellespont, now the Dardanelles. This, according to some, was the ground of the poetical fable, that a ram with a golden fleece swam away with them to Colchis, and that the Argonauts undertook their famed expedition in order to find that fleece. But Strabo and Arrian inform us, that it was the practice of the Colchians to collect gold on mount Caucasus by extend-

ing fleeces across the beds of the torrents; and as the water passed, the metallic particles remained entangled in the wool; hence, according to those historians, the adventure was named the expedition of the golden fleece. Sir Isaac Newton thinks that this expedition was really an embassy sent by the Greeks, during the intestine divisions of Egypt in the reign of Amenophis, to persuade the nations upon the coasts of the Euxine and Mediterranean seas to take that opportunity of shaking off the yoke of Egypt, which Sesostris had laid upon them; and that fetching the golden fleece was only a pretence to cover their true design. The most judicious and satisfactory account of the Argonautic expedition seems to be that given by Dr. Gillies in his History of Greece: 'The northern districts of Thessaly being peculiarly exposed to the dangerous fury of invaders, the petty princes of that province entered into a confederacy for their mutual defence. They assembled in spring and autumn at Thermopylæ, a place afterwards so illustrious, and then governed by Amphictyon a descendant of Deucalion, whose name is immortalised in the Amphictyonic council. The advantages which the confederates derived from this measure were soon perceived by their neighbours. The central states gradually acceded to their alliance; and about the middle of the fourteenth century before Christ, Acrisius king of Argos, and other princes of the Peloponnesus, were allowed to share the benefits and security of this useful association. (See AMPHICTYONS.) After this event the Amphictyons appear to have long confined themselves to the original purpose of their institution. The states, whose measures were directed by this assembly, found sufficient occupation in defending their own territories; and near a century elapsed before they undertook, by common consent, any distant expedition. But it was not to be expected that their restless activity could be always exhausted in defensive war. The establishment of the Amphictyons brought together the chiefs most distinguished by birth and bravery. Glory and emulation prompted them to arms, and revenge directed those arms against the barbarians. Jason, Admetus, and other chieftains of Thessaly, having equipped a small fleet in the harbour of Iolcus, and particularly the ship Argo, of superior size and construction to any before known, were animated with a desire to visit foreign lands, to plant colonies in those parts of them that appeared most delightful, and to retort on their inhabitants the injuries which Greece had suffered from strangers. The princes of the north having proclaimed this spirited design over the central and southern provinces, the standard of enterprise and glory was speedily surrounded by the flower of the Grecian youth, who eagerly embraced this honorable opportunity to signalise their manly valor. Peleus, Tydeus, Telamon, and in general the fathers of these heroic chiefs, who in the succeeding age shone with distinguished lustre in the plains of Troy, are numbered among the leaders of the Argonauts. They were accompanied by the chosen warriors, and by the venerable prophets of their respective tribes; by an Æsculapius, the admired father of the healing art; and by the divine Orpheus whose sublime genius was worthy to celebrate the amazing series of their adventures. These adventures, however, have been too much adorned by the graces of poetry to be the proper subjects of historical composition. The designs of the Argonauts are veiled under the allegorical, or at least doubtful, phrase of 'carrying off the golden fleece;' which, though easily explained, if we admit the report that the inhabitants of the eastern banks of the Euxine extended fleeces of wool, in order to collect the golden particles which were carried down by the torrents from mount Caucasus, is yet described in such various language by ancient writers, that almost every modern who examines the subject thinks himself entitled to offer, by way of explanation, some new conjecture of his own. But in opposition to the most approved of these conjectures, we may venture to affirm, that the voyage to Colchis was not undertaken with a view to establish extensive plans of commerce, or to search for mines of gold, far less to learn the imaginary art of converting other substances into that precious metal; all such motives supposing a degree of speculation and refinement unknown in that age to the gallant but uninstructed youth of Thessaly. The real object of the expedition may be discovered by its consequences. The Argonauts fought, conquered, and plundered; they settled a colony on the shores of the Euxine; and carried into Greece a daughter of the king of Colchis, the celebrated Medea, a princess of Egyptian extraction, whose crimes and enchantments are condemned to eternal infamy in the immortal lines of Euripides.'

ARGONAUTS OF ST. NICHOLAS, a military order, instituted by Charles III. king of Naples in 1382 for the advancement of navigation, or, as some say, merely for preserving amity among the nobles. They wore a collar of shells enclosed in a silver crescent, whence hung a ship with this device, 'Non credo tempori,' 'I do not trust time.' Hence these Argonaut knights came to be called 'knights of the shell.' They received the order of St. Basil archbishop of Naples, and held their assemblies in the church of St. Nicholas their patron.

ARGONNE, a ci-devant province or territory of France, comprehending all that part of the country that lies between the rivers Meuse, Marne, and Aisne. St. Menehold was the capital.

ARGOPHYLLUM, in botany, WHITE-LEAF: a genus of the monogynia order, belonging to the pentandria class of plants. The capsule is trilocular; the nectarium is pyramidal, pentagonous, and the length of the corolla. There is but one species, viz. A. nitidum, or the glossy argophyllum, a native of New Caledonia. This species has great affinity with the ivy; but differs in the nectarium, and perhaps in the fruit.

ARGOS, an ancient name of Peloponnesus; so called from Argus one of its kings.

ARGOS, an inland town, and the capital of Argolis or Argia. It had different epithets, as Achaicum from the original inhabitants; Hippium from its breed of horses; and Inachium from the river Inachus which runs by it. The Argives related that Inachus was one of the

river gods who adjudged the country to Juno when she contended for it with Neptune, which deity in return made their water to vanish; the reason why the Inachus flowed only after rain and was dry in summer. The source was a spring, not copious, on a mountain in Arcadia, and the river served there as a boundary between the Argives and Mantineans.

Argos stood chiefly on a flat. The springs were near the surface; and it abounded in wells which were said to have been made by the daughters of Danaus. This ancient personage lived in the acropolis or citadel, which was named Larissa, and accounted moderately strong. On the ascent was a temple of Apollo on the ridge, which in the second century continued the seat of an oracle. The prophetess was debarred from commerce with the male sex: a lamb was sacrificed once a month in the night, when, on tasting the blood, she became possessed with the divinity. Farther on was a stadium where the Argives celebrated games in honor of Nemean Jupiter and of Juno. On the top was a temple of Jupiter without a roof, the statue off the pedestal. In the temple of Minerva, among other curious articles, was a wooden Jupiter with an eye more than common, having one in the forehead. This statue, it was said, was once placed in a court of the palace of Priam, who fled as a suppliant to the altar before it, when Troy was sacked. In this city was also the brazen tower in which Danaë, the daughter of king Acrisius, being confined there by her father, was deflowered by Jupiter, or more probably by one of his priests.

Argos retains its original name and situation, standing near the mountains which are the boundary of the plain, with Napoli di Romania and the sea in view before it. The shining houses are whitened with lime or plaster. Churches, mud-built cottages and walls, with gardens and open areas, are interspersed, and the town is of considerable extent. Above the other buildings a very handsome mosque is seen, shaded with cypresses; and behind is a lofty hill, of a conical form, the summit of which is crowned with a neglected castle. The devastations of time and war have effaced the old city. We look in vain, says Mr. Chandler, for vestiges of its numerous edifices, the theatre, the gymnasium, the temples, and monuments, which it once boasted, contending even with Athens in antiquity and in favors conferred by the gods. It is situated twenty-five miles south of Corinth. It has still a population of nearly 10,000; it has also a citadel and a bishop. The Venetians took it 1686, but lost it in 1716, since which it has continued in the hands of the Turks. Twenty miles south of the bishopric of Strasburg, bailiwic of Dach-Corinth. Long. 22° 47′ E., lat. 37° 48′ N.

Argos Amphilochicum, a city of Acarnania, situated on the east side of the Sinus Ambracius; 180 stadia south-east of Ambracia. It was so named from Amphilochus the son of Amphiaraus, and Argos his country. It was also called Argia Amphilochis, and Amphilochia.

Argos Hippium, an ancient name of Arpi; afterwards called Argyrippa, and Argippa; built by Diomedes on the Cerbalus. It was a large and populous city of Apulia; and is now called Arpi, but in ruins.

Argos Pelasgicum, Thessaly; so called from the Pelasgi.

Argos Portus, a port of Tuscany; now called Porto Ferraro, in the north of the island Elba. Long. 11° 30′ E., lat. 42° 35′ N.

ARGOSTOL, or Argostoli, a sea-port of Cephalonia, opposite to Albania. It is the best harbour in the island. It is five miles distant from the fortress, where the proveditor resides.

ARGOW, or Aargow, a county of Switzerland adjacent to the Aar, whence its name, and forming the north-eastern part of the canton of Bern.

AR'GUE,
Ar'guer,
Ar'gument, *v.* & *n.*
Argumen'tal,
Argumenta'tion,
Argumen'tative,
Argumen'tatively,
Ar'gumentize.

Lat. *arguo*, to show, to declare, from αργος, clear. To make clear or manifest, to adduce evidence, the object of which should be to elicit and exhibit truth, to reason, to represent as probable or necessary, to convince. To make clear or manifest, in which sense argument is applied to a brief sketch or outline or abstract of a book or treatise. To indicate, to adduce evidence, to allege reasons for or against a doubtful point, to debate, to dispute.

I wote wel clerkes wol sain as hem lest
By *arguments*, that all is for the best;
Tho I ne can the causes nought yknow,
But thilke God that made the wind to blow,
As kepe my lord: this is my conclusion,
To clerkes lete I all disputison.
Chaucer. Frankeleine's Tale.

Hol. He draweth out the thread of his verbosity finer than the staple of his *argument*.
Shakspeare. Love's Labour Lost.

Of good and evil much they *argued* then. *Milton.*

Forwardness *argues* insufficiency.
Hall's Contemplations.

What more *argues* dislike of the person, than the turning back of his present. *Id.*

First, if we consider what the soul is in its own capacity to happiness, we shall find it to be an excellency greater than the sun, of an angelic substance, sister to a cherub, an image of the divinity, and the great *argument* of that mercy whereby God did distinguish us from the lower form of beasts, and trees, and minerals. *Jeremy Taylor.*

When the *arguments* press equally on both sides in matters that are indifferent to us, the safest method is to give up ourselves to neither. *Addison.*

What object, what event the moon beneath,
But *argues* or endears an after-scene?
To reason proves, or weds it to desire? *Young.*

It is not the being singular, but being singular for something, that *argues* either extraordinary endowments of nature, or benevolent intentions to mankind, which draws the admiration and esteem of the world. *Berkeley.*

In *arguing* too, the parson own'd his skill,
For e'en tho' vanquish'd, he could *argue* still;
While words of learned length and thundering sound
Amazed the gazing rustics ranged around.
Goldsmith.

Like Murray he did not conduct the understanding through the painful subtility of *argumentation*; nor was he like Townshend, for ever on the rack of exertion; but rather lightened upon the subject. His

reached the point by the flashings of the mind, which, like those of his eye, were felt, but could not be followed. *Grattan's Character of Lord Chatham.*

Were those [the apostles] weak men, who taught a system of opinion, which even the sovereigns of the world, and some of the least cruel, the most learned, and the most politic of them too, thought it their interest to bear down and destroy, not with *argument*, in which it would appear they had no confidence, but with fire and sword? *Beattie.*

Thus Rodmond, train'd by this unhallow'd crew,
The sacred social passions never knew;
Unskill'd to *argue*, in dispute yet loud,
Bold without caution, without honors proud.
Falconer's Shipwreck.

ARGUIM, or ARGUIN, an island on the coast of Africa, about sixteen, or, as others say, thirty miles from Cape Blanco, scarcely two miles in length; notwithstanding which, the possession of it was violently disputed for eighty-seven years between the Portuguese, Dutch, English and French; and, after a variety of fortune, has at last been totally abandoned. Long. 16° 20′ W., lat. 20° 30′ N.

This island was first discovered by the Portuguese in 1444; a fort was erected on the island, and the Portuguese enjoyed the peaceable possession of it till 1638. At this time the Dutch landed with a body of troops without molestation from the garrison, which was too weak to oppose them. The Portuguese, however, defended themselves with great intrepidity, and at last surrendered upon honorable terms. The Dutch immediately set about repairing the fortifications, and securing it in the best manner they could: however, in 1665 the fort was reduced almost to a heap of rubbish by an English squadron; but it was retaken by the Dutch the next year, who by affording every encouragement to settlers, and by giving extravagant prices for gums, monopolised the gum trade. By this means the gum trade of the French Senegal Company was almost destroyed; upon which they fitted out a squadron, dispossessed the Dutch, and had the island finally ceded to them by the treaty of Nimeguen. The Dutch however, under pretence of being subjects of the elector of Brandenburg, erected one of the forts which had been demolished, and there maintained themselves in spite of the utmost endeavours of the French Company to dispossess them. In 1717, however, the French Company having found all their remonstrances ineffectual, fitted out a new squadron; but this armament did not arrive at Arguim before February 26th, 1721. The Dutch defended themselves with such intrepidity as had almost baffled the utmost efforts of the French; but the latter having drawn off a Moorish chief from his alliance, the Dutch were obliged to evacuate Arguim, and retire to Portendic, where they fortified themselves, determining to watch a favorable opportunity for recovering their settlement at Arguim. This soon occurred by the imprudence of Duval the French director; who, having quarrelled with the Moors, was surprised, defeated, and killed by them; in consequence of which the settlement fell again into the hands of the Dutch on the 11th of June, 1722. In 1723 the Dutch were attacked by another French squadron under the command of the Sieur Riguadiere, who boasted that the fort could not hold out one day; but though he prevailed so far as to get possession of the cisterns which contained the water of the besieged, he was at last shamefully repulsed, and forced to raise the siege with precipitation. The Dutch, however, did not long enjoy the possession which they had so bravely defended; for in 1725 their fort was entirely demolished by the French under Du Casse, and has never since been rebuilt.

ARGUMENT, in logic and rhetoric, an inference drawn from premises, the truth of which is indisputable, or at least highly probable. See LOGIC.

ARGUMENT OF INCLINATION, in astronomy, is an arch of a planet's orbit intercepted between the ascending node, and the place of the planet from the sun, numbered according to the succession of the signs.

ARGUMENT OF THE MOON'S LATITUDE is the distance of the moon's true place from the sun's. By this we find the quantity of the real obscuration in eclipses, or how many digits are darkened in any place.

ARGUMENTATION, according to Cicero, is the delivering or unfolding of an argument. The matter of argumentation is propositions; the form, their due disposition with regard to one another, so as a conclusion may be drawn from them.

ARGUMENTUM AD HOMINEM, is to press a man with consequences drawn from his own principles and concessions.

ARGUMENTUM AD JUDICIUM, an argument addressed to the judgment drawn from any foundation of knowledge or probability. Mr. Locke reckons this the best species of argument.

ARGUMENTUM A TUTO, an argument drawn from the consideration that it is more safe to choose the one side of a question than the other, where the evidence seems doubtful or nearly equal on both sides. This species of argument is said to have been first used by Arnobius, and has been since successfully adopted by Paschal, Tillotson, Gastrel, and other advocates for Christianity, against Deists and Atheists; who, while they endeavour to undermine our faith in the gospel, and our hopes arising from it, give us nothing safe or certain in its place.

ARGUMENTUM BACULINUM literally signifies a cudgelling or knock-down argument; and is applied in cases where compulsion is used instead of reasoning. Every species of persecution for opinions, whether religious, political, or philosophical, may be termed an argumentum baculinum.

ARGUNSKOI, a town of Siberia, on the frontiers of Chinese Tartary; containing mines of silver and lead, and a pearl fishery in the river Argun, on the west bank of which the town is situate. It is seventy miles S. E. of Nertchinsk. Long. 118° E., lat. 52° 30′ N.

ARGUS, in fabulous history, was the son of Arestor, and had 100 eyes, fifty of which were always open. Juno made choice of him to guard Io, whom Jupiter transformed into a white heifer; but Jupiter pitying Io for being so closely confined, sent Mercury, who with his

flute charmed Argus to sleep, sealed up his eyes with his caduceus, and then cut off his head; when Juno, to reward his fidelity, turned him into a peacock, and placed his eyes in his tail.

ARGUS, the son of Jupiter and Niobe, the founder and first king of Argos.

ARGUS, the son of Polybus and Argia, the carpenter and ship-master of the Argo.

ARGUS, in ornithology, a species of pheasant in Chinese Tartary.

ARGUS, in zoology, a kind of animal full of eyes, called in Iceland oscabicorn; of which Wormius and Jacobus have given descriptions. It is of the testaceous kind, of an oblong form, resembling a crab's tail, and about two fingers' breadth in length.

ARGUS-SHELL, in conchyliology, a species of porcelain shell, beautifully variegated with spots, resembling those in a peacock's tail.

ARGUTE', ARGUTE'NESS, ARGUTA'TIONS. } From *arguo*, *argutum*, to make clear. Ingenious, skilful, sharp, subtle, witty.

I wis it is not the force of their *argutation* that could move me one foot forwards.

Bishop Hall's Polemical Works.

There have been those who have not only advanced doubts concerning propositions attested to by clearest sense, and inferred by strong discourse, but have by their *argute* cavillations bid fair to shake the foundations of all human science. *Barrow's Sermons.*

You are wrong, said my father, *argutely*; and for this plain reason. *Sterne's Tristram Shandy.*

ARGYLE or ARGYLL, a county of Scotland, bounded on the south by the Irish Sea and the Frith of Clyde; on the east by the counties of Perth and Dumbarton; on the north-east by Lochaber; and on the north-west by several islands. It extends in length from south to north between the Mull of Kintyre and the point of Ardnamurchan, where it joins Inverness-shire, about 114 miles; and in breadth in some places, including the isles, to seventy. It was anciently called Argathelia, and together with Perthshire and the Western Islands constituted the ancient kingdom of the Scots, while the rest of Caledonia was subject to the Picts and Romans. It comprehends Kintyre, Knapdale, Argyle Proper, Cowal, and Lorne. This country, like most other parts of the Highlands, affords a very wild prospect of hills, rocks, huge mountains, and tremendous precipices, piled upon each other in a stupendous manner; bare, bleak, and barren to the view; or at best covered with shaggy heath, which appears black and dismal, except in summer, when it is variegated with an agreeable bloom of a purple color. The coast of Argyle is rocky; yet indented with bays and inlets, that afford good harbours for shipping. The country is well watered by rivers, brooks, and lakes, abounding with fish; the vales and flat parts of it are cultivated for corn; the mountains feed an innumerable quantity of black cattle, which run wild among the hills in winter, as well as summer; the heath and woods, of which there is a considerable number, afford shelter to deer, roebucks, and all sorts of game in great plenty: the circumambient sea, with its lochs, bays, and harbours, pours forth myriads of fish; but the innate wealth of the country is dug from the bowels of the mountains in iron, copper, lead, and other metals and minerals. Argyle is the seat of a provincial synod, consisting of five presbyteries and fifty parishes. Argyle-shire is generally peopled by the clan of Campbell; and contains a great number of castles and seats belonging to gentlemen who hold of the duke, and boast themselves descended from his family. It sends one member to parliament. The resident population in 1801, was 71,859; and in 1811 it had increased to 85,585.

ARGYLE, DUKES OF. See CAMPBELL. The ancient and noble family of Campbell, the most powerful of the Scottish nobility, take their titles of duke and earl from this county. The duke of Argyle is, by hereditary right, great master of the king's household in Scotland; admiral of the Western Isles; general of Denoon castle; keeper of Dunstaffnage and Carrick, and, before the jurisdictions were abolished, enjoyed other hereditary offices, which rendered him too powerful as the subject of a limited monarchy. He still possesses many royalties; his vassals, even of the name of Campbell, are so numerous, and his influence extends so far, that he could, on occasion, bring 3000 or 4000 fighting men into the field.

ARGYLE PROPER is that district of Argyleshire which is bounded by Knapdale and Cowal on the south, Lochaber on the north, Lennox and the Grampian hills on the east, and Lorne on the west. It lies between Lochfyn and Lochlow; which abound with excellent trout and salmon.

ARGYRASPIDES, or ARGYROASPIDES; from *αργυρον*, silver, and *ασπις*, a shield; in antiquity, soldiers armed with silver bucklers, or bucklers silvered. This corps, according to Quintus Curtius, was the second of Alexander's army; the phalanx being the first. Justin says, that Alexander having penetrated into India, and extended his empire as far as the ocean for a monument of his glory, ordered the armor of his soldiers, and the housings of his horses, to be adorned with silver. From this author it would seem that Alexander's whole army were called argyraspides. After that prince's death the argyraspides despised all other chiefs of the army, disdaining to obey any other, having borne arms under Alexander.

ARGYRITÆ AGONII, in antiquity, games in which money was the prize.

ARGYRITIS, in natural history, a name given by the ancients to a substance resembling silver. In this sense argyritis was used to signify such litharge as was of a white color, to distinguish it from that which was yellow, which they dignified with the name of chrysitis, as we do at present with that of litharge gold. The argyritis of modern writers seems to have been the same with the lapis magnetis of the ancients, mentioned by Theophrastus, and distinguished from the magnet.

ARGYRODAMAS, in natural history, a sort of silver-colored talc, which bears the fire, and neither burns, melts, nor changes its hue.

ARGYROGONIA is used by alchemists for a kind of argentific, or silver-making seed, pretended to be procurable from a solution of that metal perfectly concocted.

ARGYROLIBANUS, in the materia medica

of the ancient Greeks, a word used to express the white kind of olibanum.

ARGYROPEA, or ARGYROPŒIA; from αργυρος, silver, and ποιεω, to make; in alchemy, the art of making silver out of imperfect metals.

ARGYTHAMNIA, in botany, a genus of the class and order monœcia tetandria: the essential character is, male calyx four-leaved: corolla four-petalled: female calyx five-leaved, corolla none, styles dichotomous, capsule nicocceous, solitary seeds. There is one shrubby species a native of Jamaica.

ARHUSEN, or AARHUSEN. See AARHUUS.

ARIA; Αρεια, Gr. martial; one of the ancient names of Thrace, from the character of the people, whose country Euripides calls the residence of Mars. It was the birth-place of Sophocles.

ARIA, or ARIAPOLIS, now called Herat, in Chorasan, an ancient town situated on the river Arias, which probably gave name to the country Ario.

ARIADNÆA, in German antiquity, two festivals at Naxos, in honor of two women named Ariadne. In the solemnity dedicated to one of them, they had a show of sorrow and mourning; and, in memory of her being left by Theseus near the time of child-birth, it was usual for a young man to lie down and counterfeit all the agonies of a woman in labor. This festival is said to have been first instituted by Theseus, to atone for his ingratitude to that princess! The other Ariadne was thought to be of a gay and sprightly temper; and therefore her festival was observed with music and other expressions of mirth and joy.

ARIADNE, daughter of Minos king of Crete. Theseus being sent to destroy the Minotaur, Ariadne was so taken with him, that, as a testimony of her love, she gave Theseus a clue of thread to guide him out of the labyrinth. Theseus, having killed the Minotaur, carried off the Athenians he had relieved, together with Ariadne; whom, however, he afterwards forsook.

ARIADNE, in sculpture, a beautiful statue of Parian marble, now in the Vatican, in which Ariadne is represented sleeping on the rocks of Naxos, where she was left by Theseus. The supposed state of her mind is beautifully represented by the expression of her countenance, although in slumber. On the upper part of her left arm is a bracelet, called by the ancients ophis, in the form of a little serpent, which had long occasioned this statue to be taken for a Cleopatra.

ARIANA, in ancient geography, an extensive country, comprising Paropamisus, Arachosia, Drangiana, and Gedrosia.

ARIANISM, the doctrine of Arius, who lived in the beginning of the fourth century. See ARIANS.

ARIANNA, a small village, six miles north-east from Tunis, remarkable for a beautiful range of the ancient Carthaginian aqueduct, seventy-four feet high, supported by columns sixteen feet square, and which still increased in grandeur the nearer it approached Carthage. The stone was all diamond cut. Near this spot several ancient matamores, or subterraneous magazines for corn, have been discovered within these few years, capable of containing 100 bushels, strongly arched with large square stones. The Moors have already begun to demolish them, it being their custom to do so with every monument of art as soon as they discover it.

ARIANO, a town of Italy, in the pope's territories, seated on a branch of the Po, twenty-two miles north-east of Ferrara. Long. 12° 8′ E., lat. 45° 0′ N.

ARIANO, a town of Italy, in the ulterior principality of Naples, under the archbishop of Benevento, fifteen miles north-east of that town, and ten north-west of Trevico. It is a poor place, without trade or manufactures; having decayed since the desolation caused by an earthquake in 1456. It contains about 10,000 inhabitants, and no less than 20 parishes and convents, besides an ill-endowed cathedral. Below the town is a convent of Dominicans, whose house, within these last 100 years, has been thrice overthrown by earthquakes. The last and most destructive happened in 1732, and was fatal to all the country along the eastern verge of the Appennines.

ARIANS, followers of Arius, a presbyter of the church of Alexandria, about A.D. 315; who maintained that the Son of God was totally and essentially distinct from the Father; that he was the first and noblest of those beings whom God had created, the instrument by whose subordinate operation he formed the universe; and therefore inferior to the Father both in nature and dignity: also that the Holy Ghost was not God, but created by the power of the Son. The Arians owned that the Son was the Word, but denied that Word to have been eternal. They held that Christ had nothing of man in him but the flesh, to which the λογος or Word was joined, which was the same as the soul in us.

The Arians were first condemned and anathematised by a council at Alexandria in 320, under Alexander bishop of that city, who accused Arius of impiety, and caused him to be expelled from the communion of the church; and afterwards by 380 fathers in the general council of Nice, assembled by Constantine in 325. The doctrine, however, was not extinguished; on the contrary, it became the reigning religion, especially in the east, where it obtained much more than in the west. Arius was recalled from banishment by Constantine in two or three years after the council of Nice, and the laws that had been enacted against him were repealed. In 335 Athanasius, his zealous opponent, was deposed and banished into Gaul, and Arius and his followers were reinstated in their privileges, and received into the communion of the church. In little more than a year after this, he fell a victim to the resentment of his enemies, and died a tragical death, probably occasioned by poison. See ARIUS. The Arian party found a protector in Constantius, who succeeded his father in the east; and the zeal with which he abetted them produced many animosities and tumults to the time of his death in 362. They underwent various revolutions, persecutions and oppressions under succeeding emperors, according to the degree of interest they had in the civil power, till at length Theodosius the Great exerted every

possible effort to suppress and disperse them. Their doctrine was carried, in the fifth century, into Africa under the Vandals; and into Asia under the Goths. Italy, Gaul, and Spain, were also deeply infected with it; and towards the commencement of the sixth century it was triumphant in many parts of Asia, Africa, and Europe. But it sunk almost all at once when the Vandals were driven out of Africa, and the Goths out of Italy, by the arms of Justinian. However, it revived again in Italy under the protection of the Lombards in the seventh century. Erasmus seems to have aimed in some measure to restore Arianism, at the beginning of the sixteenth century, in his Commentaries on the New Testament. Accordingly, he was reproached by his adversaries with Arian interpretations and glosses, Arian tenets, &c. To which he made little answer, save that there was no heresy more thoroughly extinct than that of the Arians: 'Nulla heresis magis extincta quam Arianorum.' But the face of things was soon changed. Servetus, a Spaniard by nation, published, in 1531, a little treatise against the Trinity, which once more revived the opinion of the Arians in the west. Indeed he rather showed himself a Photinian than an Arian; only that he made use of the same passages of Scripture, and the same arguments against the Saviour, with the proper Arians. Servetus had not, properly speaking, any disciples; but he gave occasion, after his death, to the forming of a new system of Arianism in Geneva, much more subtle and artful than his own, and which not a little perplexed Calvin. From Geneva the new Arians removed to Poland, where they gained considerable ground; but at length became Socinians. The appellation Arian has sometimes been indiscriminately applied, in modern times, to all those who consider Jesus Christ as inferior and subordinate to the Father, and whose sentiments cannot be supposed to coincide exactly with those of the ancient Arians. Mr. Whiston was one of the first divines who revived the controversy in the beginning of the eighteenth century. He was followed by Dr. Clarke, who published his famous book entitled The Scripture Doctrine of the Trinity, &c. In consequence of which, he was reproached with the title of Semi-Arian. He was also threatened by the convocation and combated by argument. Dr. Waterland, who has been charged with verging towards Tritheism, was one of his principal adversaries. Ancient Arianism admitted many subdivisions of opinion: and in modern times high and low Arians are terms that have been been applied to those who advocate the extremes of the Arian doctrine; the former raising the character of Christ to a kind of subordinate deity; the latter depressing it almost to mere humanity.

The passages of Scripture on which Arians chiefly rely for the establishment of their sentiments are: 1. Such as speak of the supremacy of the Father, as Matt. xv. 32.; xix. 17.; xxvii. 46.; John xx. 17.—2. Of the inferiority or subordination of the Son: Mark xiii. 32.; John xiv. 28.; 1 Cor. xi. 3.; xv. 24.; Ephes. i. 17.: and, 3. Those in which all religious homage is referred to the Father: Matt. iv. 10.; John iv. 23.; Acts iv. 24.; 1 Cor. i. 4.; Phil. i. 3, 4. The late Dr. Price was an eminent advocate for the Arian system; Dr. John Taylor, of Norwich, &c.; and we suppose we may now add the distinguished literary name of the late Dr. Abraham Rees, to the list of modern Arians. See the Article Price, Rees's Cyclopædia.

The Arians were divided into various sects, of which ancient writers give an account under the name of Semi-Arians, Eusebians, Aetians, Eunomians, Acacians, Psathyrians, and others. But they have been commonly distributed into three classes, viz. the Genuine Arians, Semi-Arians, and Eunomians.

ARIARATHES, the name of several ancient kings of Cappadocia. The last of them being overcome by Perdiccas, set fire to his palace, and burnt himself, his family, and effects in it, rather than submit to be carried captive.

ARIAS Montanus, a learned Spanish divine, employed by Philip II. of Spain to publish another edition of the Bible, after that of Cardinal Ximenes; which he finished with applause, and died at Seville in 1598.

ARICA, a sea-port of South America, in the province of Los Charcas, in Peru. It was formerly a considerable place; but was almost entirely destroyed by an earthquake in 1605; so that now there are only about 150 families, most of them blacks, mulattoes, and Indians. The houses are made with canes or reeds set upright, and bound together with cords or thongs; and, as it never rains here, they are covered only with mats, which makes the place look at a distance like a heap of ruins. The vale of Arica is about a league wide, and six leagues long, next the sea, and is all a barren country, except the spot where the old town stood, which is divided into little meadows of clover grass, and plots of sugar-canes, with a few olive and cotton trees intermixed. The vale grows narrower as it runs eastward; and a league up there is a village, where they cultivate pimento or Jamaica pepper, which is planted throughout all the rest of the vale; and there are several farms which produce nothing else, that bring in the value of 80,000 crowns yearly. The Spaniards of Peru are so used to this pepper, that they dress no provisions without it. Long. 70° 15′ W., lat. 18° 26′ S.

ARICONIUM, a town of the Silures, a nation of the ancient Britons, now called Hereford. Long. 2° 42′ W., lat. 52° 4′ N.

AR'ID, } Lat. *aridus*, from *areo*. Dry,
Arid'ity } parched, burnt up.

> His harden'd fingers deck the gaudy spring,
> Without him summer were an *arid* waste.
>
> *Thomson.*

> Salt taken in great quantities will reduce an animal body to the great extremity of *aridity* or dryness.
>
> *Arbuthnot on Aliments.*

ARIDAS, a kind of taffety, manufactured in the East Indies from a shining thread obtained from certain herbs, whence they are styled aridas of herbs.

ARIDED, or Aridef, in astronomy, a fixed star of the second magnitude, in the extremity of the swan's tail. It is also called Hiereza and Adigege.

ARIDULLAM, in natural history, a kind of zarnic found in the East Indies. See Zarnic.

ARIDURA, in physic, a dryness or want of moisture. The word is also used by some for an aridity, or consumption; by others, for an hectic fever; and more frequently by modern writers, for a wasting of some single member of the body, in which sense it amounts to the same with what is called withering.

ARIEGE, a river of France, which rises in the Pyrenean mountains, and running by Foix and Pamiers falls into the Garonne. Gold-dust is found amongst its sands.

ARIEL, a name of Jerusalem, so called from its warlike force.

ARIERE-BAN, a term used for the proclamation of war by the ci-devant kings of France.

ARIES, Lat. the ram; one of the twelve signs of the zodiac; the vernal sign.

ARIES, in artillery, a battering-ram, or a military engine with an iron head, much in use among the ancients to batter and beat down the walls of places besieged. Of this there were three kinds; the first rude and plain, and no more perhaps than a great beam, which the soldiers bore in their arms, and with one end of it, by main force, assailed the walls. This required great force to work it, but produced little effect. The second or compound ram is described by Josephus (De Excid. Hierosol. 3.) thus: 'The ram is a vast long beam, like the mast of a ship, strengthened at one end with a head of iron, somewhat resembling that of a ram, whence it took its name. This is hung by the middle, with ropes, to another beam which lies across two posts; and hanging thus equally balanced, is by a great number of men violently thrust forward, and recoiled backward, and so shakes the wall with its iron head, nor is there any tower or wall so thick or strong, as to resist the repeated assaults of this forcible machine.' The third only differed from this, in that it was covered with a χελωνη, or screen, to guard the soldiers; whence it was called testudo arietaria.

Mr. Felibien describes a fourth sort of battering-ram, which ran on wheels, and was the most perfect and effectual of them all. Vitruvius affirms that the battering-ram was first invented by the Carthaginians, while they laid siege to Cadiz: theirs was the simple kind first mentioned. Pephasmenos, a Tyrian, afterwards contrived to suspend it with ropes; and finally, Polydus, the Thessalian, to mount it on wheels, at the siege of Byzantium, under Philip of Macedon. Yet Pliny assures us that the ram was invented at the siege of Troy; and it was this that gave occasion to the fable of a wooden horse. The invention has been ascribed by some to Artemorus a Greek architect, who flourished 441 years before Christ. Some have supposed that the walls of Jericho, mentioned in the book of Joshua, were beaten down by this instrument; the ram's horns by which they were overthrown being no other than the horns of the battering-ram.

Plutarch tells us, that Marc Antony, in the Parthian war used a ram of eighty feet long; and Vitruvius says they were sometimes made 106, and sometimes 120 feet long; to which perhaps the force of the engine was in a great measure owing. The ram was managed at once by a whole century of soldiers; so that it played continually and without intermission; being usually covered with a vinea to protect it from the attempts of the enemy.

The battering-ram is represented in Plate I Artillery, fig. 1. This ram A B is suspended by a rope *x* to the cross-beam *y*, at the top of the frame C D. Its head A is fastened to a large beam by three or four bands of iron four feet broad. At the extremity of each of these bands *a*, was a chain, *b*, also of iron, fastened by one end to a hook *c*; and at the other extremity of each of these chains was a cable firmly bound to the last link. These cables extended through the whole length of the beam to the end of the ram B, where they were bound firmly together with small ropes. To the end of these cables was fixed another, composed of several strong cords plaited together for some length, and then running single. At each of these several men were placed to balance and work the machine. The unsuspended ram differed from this only in the manner of working it: instead of being slung by a chain or cable, it moved on small wheels on another large beam.

These battering-rams, by their own weight, and by the action of the men who impelled them, exerted a force which in some cases exceeded the utmost effect of our battering cannon. Dr. Desaguliers (Lectures, vol. i. p. 65.) has demonstrated that the momentum of a battering-ram, twenty-eight inches in diameter, 180 feet long, with a head of cast iron of one ton and a-half, the whole ram weighing with its iron hoops 41,112 pounds, and moved by the united strength of 1000 men, would only be equal to that of a ball of thirty-six pounds weight, shot point blank from a cannon. Mr. Attwood, comparing the effect of the battering-ram, having its metal extremity equal to a twenty-four pounder, with a cannon ball of twenty-four pounds weight, observes, that in order to their producing the same effect in penetrating a wall or making a breach in it, the weight of the ram must exceed that of the cannon-ball in the proportion of the square of 1700, the velocity of the ball, to the square of the velocity with which the battering-ram could be made to impinge against the wall expressed in feet. Estimating this at ten feet in a second, the proportion of the weights will be that of about 2,890,000 to 100, or 28,900 to 1; and therefore the weight of the battering-ram must be 346 tons. In this case the battering-ram and the cannon-ball, moving with the velocities of 10 and 1700 feet in a second, would have the same effect in penetrating any obstacle; but, as the weight of the ram was probably never so great as the above supposition states it to have been, the force of a cannon-ball to make a breach in walls must exceed that of the ancient aries: but the momentum of this, of the impetus by which it communicated a shock to the whole building, was far greater than the utmost force of cannon-balls; for if the weight of the battering-ram were no more than 170 times greater than that of a cannon-ball, each moving with its respective velocity, the momenta of forces of both would be equal; but, as the weight of these ancient machines was certainly much greater than 170 times that of our heaviest cannon-balls,

their momentum or impetus to shake or overturn walls or demolish buildings was much superior to that which is exerted by the modern artillery. And since the strength of fortifications will in general be proportioned to the means which are used for their demolition, the military walls of the moderns have been constructed with less attention to their solidity and massy weight than the ancients thought to be a necessary defence against the aries; that sort of cohesive firmness of texture which resists the penetration of bodies being now more necessary than in ancient times. Nevertheless it is manifest, that even our solidity or weight in fortifications is also of material consequence to the effectual construction of a wall or battery. The ram was frequently used in the fourteenth century. Sir Christopher Wren employed it in demolishing the walls of the old church of St. Paul's previously to his rebuilding it; and found no machine so well adapted to this purpose.

ARIETA'TION. Lat. *arieto*, to butt, to push or strike like a ram; from *aries*, a ram. Butting, pushing. A pedantic word.

The strength of the percussion, wherein ordnance do exceed all *arietations* and ancient inventions.

Bacon.

ARIETUM Levatio, an ancient kind of sportive exercise, probably the same with what of later times is called running at the quintain.

ARI FRODE, the first historiographer of Iceland, his native country, was one of the most learned men of his age. He was born in 1068, and wrote several books of history, the greater part of which have been lost; and all that now remain, are the Schedæ and Landnamabok, the latter of which was finished by Ihre after his death.

ARIGHT'. On right, justly. See Right.

Thou wolde be taught *aright*
What mischiefe bakbityng dooth.

Gower. Con. A. book ii.

If thou have led thy life *aright*,
Death is the end of misery:
If thou in God hast thy delight
Thou diest to live eternally.

Ellis's Poets, v. ii. p. 151.

We neither know God *aright*, nor seek, love, or worship him as we should.

Burton's Anatomy of Melancholy.

The Christian speaks, calls it a delight,
A day of luxury, observed *aright*;
When the glad soul is made heaven's welcome guest,
Sits banqueting, and God provides the feast.

Cowper.

ARILLUS, an improper term invented by Linnæus, and defined to be the proper exterior coat or covering of the seed, which falls off spontaneously. All seeds are not furnished with an arillus; in many, a dry covering, or scarf-skin, supplies its place. In jessamy, hound's tongue, cynoglossum; cucumber; fraxinella, dictamnus; staff-tree, celastrus; spindle-tree, euonymus; African spiræa, diosma; and the coffee-tree, coffea, it is very conspicuous. In the genus hound's tongue, four of these arilli, or proper coats, each infolding a single seed, are affixed to the stylus; and in this circumstance, says Linnæus, does the essence of the genus consist. In fraxinella the arillus is common to two seeds. The staff-tree has its seeds only half involved with this cover. The arillus is either baccatus, succulent, and of the nature of a berry, as in the spindle-tree, euonymus. Cartilagineus, cartilaginous, or gristly; as in the African spiræa, diosma. Coloratus, colored; as in the staff-tree. Elasticus, endued with elasticity, for dispersing the seeds; as is remarkable in the African spiræa, diosma, and fraxinella. Scaber, rough and knotty; as in hound's tongue. Although covered with an arillus or other dry coat, seeds are said to be naked (semina nuda) when they are not enclosed in any species of pericarpium or fruit vessel: as in the grasses, and the labiati or lipped flowers of Tournefort, which correspond to the didynamia gymnospermia of Linnæus. Seeds are said to be covered (semina tecta) when they are contained in a fruit vessel, whether capsule pod, or pulpy pericarpium, of the apple, berry, or cherry kind. See Semen. This exterior coat of the seed is, by some former writers, styled calyptra. See Calyptra. The different skins or coverings of the seed are adapted, say naturalists, for receiving the nutritive juices, and transmitting them within.

ARIMANIUS, the evil god of the ancient Persians. The Persian Magi held two principles: a good demon, or god, and an evil one: the first the author of all good, and the other of all evil: the former they supposed to be represented by light, and the latter by darkness, as their truest symbols. The good principle they named Yezad or Yezdan, and Ormozd or Hormizda, which the Greeks wrote Oromasdes; and the evil demon they called Ahriman, and the Greeks Arimanius. Some of the Magians held both these principles to have been from all eternity; but this sect was reputed heterodox; the original doctrine being, that the good principle only was eternal, and the other created.—Plutarch gives the following account of the Magian traditions in relation to these gods and the introduction of evil into the world, viz. that Oromazes consisted of most pure light, and Arimanius of darkness; and that they were at war with each other: that Oromazes created six gods; 1. the author of Benevolence; 2. of Justice; 3. of Truth; 4. of Contentment; 5. of Pleasure; and 6. of Riches; and that Arimanius made as many, who were the authors of the opposite evils or vices: that then Oromazes, triplicating himself, removed as far from the sun as the sun is from the earth, and adorned the heaven with stars, appointing the dog-star for their guardian and leader; that he also created twenty-four other gods, and enclosed them in an egg; but Arimanius having also made an equal number, these last perforated the egg, by which means evil and good became mixed together. However, the fatal time will come when Arimanius, the introducer of plagues and famine, must be of necessity utterly destroyed by the former, and annihilated; then the earth being made plain and even, mankind shall live in a happy state, in the same manner, in the same political society, and using one and the same language. Theopompus writes, that according to the Magians, the said two gods, during the space of 3000 years, alternately conquer and are conquered; that for other 3000 years they will wage mutual

war, fight, and destroy the works of each other, till at last Hades, or the evil spirit, shall perish, and men become perfectly happy, their bodies needing no food, nor casting any shadow, i. e. being perfectly transparent.

ARIMASPI, a people of Sarmatia Europea, south of the Montes Rhiphæi, said by Mela to have but one eye; a fable broached by Aristeas Proconnesius, according to Herodotus.

ARIMATHEA, a town of Judea, thought to be the same with Ramatha (1 Sam. i.), and thus in the tribe of Ephraim. This place is now called Ramla; and is in a very ruinous state, containing nothing but rubbish within its boundaries. The aga of Gaza resides here in a Serai, the floors and walls of which are tumbling down. He maintains about 100 horsemen, and as many Barbary soldiers, who, says Mr. Volney, are lodged in an old christian church, the nave of which is used as a stable, and in an ancient khan, which is disputed with them by the scorpions. The adjacent country is planted with lofty olive trees, disposed in quincunxes. The greatest part of them are as large as the walnut-trees of France; but they are daily perishing through age, from the ravages of contending factions, and even from secret mischief; for, in these countries, when a peasant would revenge himself of his enemy, he comes by night, and saws or cuts his trees close to the ground, and the wound, which he takes care to cover, draining off the sap like an issue, the olive tree languishes and dies. Among these plantations we meet at every step with dry wells, cisterns fallen in, and vast vaulted reservoirs, which prove that, in ancient times, this town must have been upwards of a league and a half in circumference. At present it scarcely contains 200 families. The little land, which is cultivated by a few of them, belongs to the mufti, and two or three persons related to him. The rest content themselves with spinning cotton, which is chiefly purchased by two French houses established there. The only remarkable antiquity at Ramla is the minaret of a ruined mosque on the road to Yafa, which is very lofty; and by an Arabic inscription appears to have been built by the sultan Salifeldin.

ARIMINUM, a town of Umbria, or Romagna, at the mouth of the Ariminus, on the gulf of Venice. The seizing on it by Cæsar gave rise to the civil war. It is now called Rimini. Long. 13° 58′ E., lat. 44° 10′ N.

ARIOBARZANES I. king of Cappadocia, was chosen by the people of that country A. A. C. 91; but, in a short time after, Tigranes, king of Armenia, expelled him. He, however, having gone to Rome, obtained such assistance as enabled him to recover the crown, which he afterwards resigned in favor of his son.

ARIOBARZANES II. being very much attached to Cæsar was declared an enemy by the republic, and put to death by Cassius A. A. C. 42.

ARIOBARZANES III. brother and successor of the last-mentioned, was dethroned and put to death by Marc Antony.

ARIOCH, king of Ellasar, an ally of Chedorlaomer, was one of the nine monarchs who engaged in the first battle of which we have any authentic account. See Gen. xiv.

ARIOLI, in antiquity, a kind of prophets, or religious conjurers, who, according to Origen and Isidore, by abominable prayers, and horrible sacrifices at the altars of idols, procured answers to their questions concerning future events. These are also called harioli, and their operation hariolation. Sometimes they were denominated aruspices, or haruspices. The arioli were distinguished by a slovenly dress, disorderly and matted beards, hair, &c.

ARION, in fabulous history, an excellent musician and poet, inventor of dithyrambics. Periander entertained him at his court, where, having amassed wealth, and returning to Corinth, the sailors, for the sake of his money, conspired to throw him overboard. In the meanwhile he requested permission to sing one funeral strain before his death; and having obtained leave, he stood upon the vessel's prow with his instrument in his hand, chaunted with a loud voice, his sweetest elegy, and then threw himself into the sea; when, according to the poets, a dolphin, charmed with his music, took him on her back, and carried him safe on shore.

ARION, in the mythology, a horse, much celebrated in poetic history. Authors speak variously of his origin, though they agree in giving him a divine one. His production is most commonly ascribed to Neptune. This god, according to some, raised him out of the ground by a stroke of his trident; according to others, he begot him upon the fury Erynnys; according to others upon Ceres, whom he ravished in the form of a horse, she having previously assumed the form of a mare to elude his pursuit. This horse was nursed by the Nereids; and being sometimes yoked with the sea-horses of Neptune to the chariot of this god, he drew him with incredible swiftness through the sea. He had this peculiarity, that his right feet resembled those of a man. Neptune gave him to Capreus, king of Haliartus. Capreus made a present of him to Hercules; who mounted him when he took the city of Elis, gained the prize with him in the race against Cygnus the son of Mars near Træcena, and at last made a present of him to Adrastus. It was under this last master that Arion signalised himself most: he won the prize for racing at the Nemean games, which the princes who went to besiege Thebes instituted in honor of Archemorus; and was the cause that Adrastus did not perish in this famous expedition, as all the other chiefs did.

ARION, in entomology, a species of papilio found in different parts of Europe. The wings are without tails, brown above and gray beneath.

ARIOSTI (Attilio) a celebrated musician, born at Bologna. He entered among the order of Dominicans; but afterwards, by virtue of a dispensation from the pope, gave up his connexion with them. He was, for some time, an opera composer at Bologna and Venice; after which he travelled into Germany and England. His performance on a new instrument, called the Viol d'Amore, attracted particular notice. He was much esteemed in England, where he published a book of cantatas, about 1725; and is said to have given lessons to Handel in his childhood. The time of his death is not certain.

ARIOSTO (Ludovico), the celebrated author of Orlando Furioso, was born at the castle of Reggio in Lombardy in 1474. His father, who was major domo to duke Hercules, lived to the extent of his fortune, and so left but little at his death. Ariosto, from his childhood, showed great marks of genius, especially in poetry; and wrote a tragedy in verse on the story of Pyramus and Thisbe, which his brothers and sisters played. His father being a man of no education, and rather regarding profit than his son's inclination, compelled him to study the civil law, in which having plodded some years to no purpose, he quitted it for more pleasing studies; yet often lamented, as Ovid and Plutarch did before him, and our own Milton since, that his father banished him from the Muses. At the age of twenty-four Ariosto lost his father, and found himself perplexed with family affairs. About six years after, his literary attainments procured him a situation under Don Hippolito cardinal of Este. At this time he had written nothing but a few sonnets; but he now resolved to compose an epic poem, and chose Boiyardo's Orlando Inamorato for a ground-work. However, he was prevented writing for a great many years, and was chosen to go on an embassy to Pope Julian II. and at his return was highly applauded. He again applied himself to his poem; but soon after incurred the cardinal's displeasure for refusing to accompany him into Hungary; by which he was so discouraged, that he deferred writing for fourteen years, till the cardinal's death. After that he finished by degrees, in great perfection, that which he began with great expectation. Duke Astolfo offered him great promotion if he would serve him; but, preferring liberty to grandeur, he refused this and other great offers from princes and cardinals, particularly from Leo X. from all whom, however, he received large presents. The duke of Ferrara delighted so much in his comedies, of which he wrote five, that he built a stage on purpose to have them acted in his court, and enabled our poet to build himself a house in Ferrara, with a pleasant garden, where he used to compose his poems, which were highly esteemed by all the princes in Italy, who sent him many presents; but he said, 'he would not sell his liberty for the best cardinal's hat in Rome.' It was a small though convenient house: being asked why he had not built it in a more magnificent manner, since he had given such noble descriptions of sumptuous palaces, beautiful porticoes, and pleasant fountains, in his Orlando Furioso? he replied, That words were cheaper laid together than stones. In his diet he was temperate; whether he was ever married is uncertain. He kept company with one Alessandra, to whom, it was reported, he was married privately, and a lady Genevera, whom he often mentions in the twenty-fourth book of his Orlando, as poets intermix with their fictions some real amours of their own. He translated the Menechmi of Plautus; and all his own comedies were so much esteemed, that they were frequently acted by persons of the first quality. When his Lena was first represented, Ferdinand of Este, afterwards marquis of Massa, spoke the prologue. He began one of his comedies in his father's lifetime, when the following incident shows the remarkable talent he had for poetry. His father one day rebuked him sharply, charging him with some great fault; but all the while he returned him no answer. Soon after his brother began the same subject; but he easily refuted him, and with strong arguments justified his own behaviour. 'Why then,' said his brother, 'did you not satisfy my father?' 'In truth,' said Ludovico, 'I was thinking of a part in my comedy; and methought my father's speech to me was so suited to the part of an old man's chiding his son, that I forgot I was concerned in it myself, and considered it only to make it a part of my play.' In person Ariosto, as appears from an admirable picture by Titian, was rather above the middle size; with a countenance grave and contemplative; his head partly bald; his hair dark and curling; his forehead high; his eyes black and sparkling; his nose large and aquiline; and his complexion inclining to the olive. He was honored with the laurel by the hands of the emperor Charles V. He was naturally affable, always assuming less than his due, yet never putting up with a known injury even from his superiors. He was so fearful on the water, that, whenever he went out of a ship, he would see others go before him; and, on land, he would alight from his horse on the least apprehension of danger. He enjoyed the friendship of the most eminent men of learning of his time, most of whom he mentions with great respect in the last canto of his Orlando Furioso. His constitution was but weakly, so that he was obliged to have recourse to physicians the greatest part of his life. He bore his last sickness with great resolution and serenity; and died at Ferrara, the eighth of July, 1533, according to Sir John Harrington, being then fifty-nine years of age. He was interred in the church of the Benedictine monks, who, contrary to their custom, attended his funeral. He had a bust erected to him, and an epitaph, written by himself, inscribed upon his tomb. His Orlando Furioso has been translated by Sir John Harrington and Mr. Hoole; but the late increased attention to Italian literature gives some reason to hope that a more elegant English version will soon be presented to the public.

ARIPPO, a small town and fort on the gulf of Manaar, in the island of Ceylon, principally connected with the pearl fishery. It is the only spot on these shores where good water is to be found. Arippo contains one of the best houses of the governor of Ceylon, a catholic chapel, and some respectable houses for the accommodation of the civil and military authorities who visit it in the fishing season. Long. 79° 40′ E., lat. 8° 47′ N.

ARISARIUM, or ARISARUM, in botany, wake-robin.

ARISE′, *v.* & *n.* } Ang.-Sax. arisan. To
ARI′SING. } mount up, to get up, to ascend, to spring from, to obtain power, office or celebrity.

This also we humbly and earnestly beg, that human things may not prejudice such as are divine,

neither that from the unlocking of the gates of sense, and the kindling of a greater natural light, any thing of incredulity, or intellectual night, may *arise* in our minds towards divine mysteries. *Bacon's Essays.*

The early violet will fresh *arise*
And spreading his flower'd purple to the skies,
Boldly the little elf the winter's spite defies.
Fletcher's Purple Island.

He rose, and looking up, beheld the skies
With purple blushing, and the day *arise*. *Dryden.*

I know not what mischief may *arise* hereafter from the example of such an innovation. *Id.*

So Esdras *arose* up, and said unto them, ye have transgressed the law. 1 *Esd.* ix. 7.

And, when he *arose* against me, I caught him by his beard, and smote him. 1 *Sam.* xvii. 35.

Another Mary then *arose*,
And did rig'rous laws impose. *Cowley.*

From Jesse's root behold a branch *arise*,
Whose sacred flower with fragrance fills the skies,
The etherial spirit o'er it's leaves shall move,
And on its top descends the mystic dove.
Pope's Messiah.

The greatest misfortunes men fall into *arise* from themselves. *Swift.*

The greatest part of our ideas *arises* from the view before or behind us; and we are happy or miserable according as we are affected by the survey of our life, or our prospect of future existence. *Rambler.*

ARISH, a Persian long measure containing about thirty-eight English inches.

ARISI, rice, an Indian word, which does not properly signify the plant which produces the rice, but the seed itself when cleansed from its husk, and rendered fit for use. The Indians call it arisi in this state; but in the husk, and upon the plant, they call it nellou. See Orisa.

ARISTA, in astronomy, the spica virginis.

Arista, in botany, a long needle-like beard, that grows out from the husk of barley or grass; called also the awn.

ARISTÆUS, the son of Apollo and Cyrene, whom, for the many services he had rendered to mankind by his knowledge of the useful arts, the gods placed amongst the stars; where he is said to be the Aquarius in the zodiac. The resemblance of his history to that of Moses has been curiously discussed by Huetius.

ARISTANDER, a famous soothsayer under Alexander the Great, over whom he gained a wonderful influence by the success of his art. He had enjoyed the same office under Philip; and explained better than his brethren the dream that this prince had after he married Olympias.

ARISTARCHUS, a celebrated grammarian, much esteemed by Ptolemy Philometor, who entrusted him with the education of his son. He applied himself chiefly to criticism, and made a revisal of Homer's poems, but in too magisterial a way; for such verses as he did not like he treated as spurious. He also criticised on other poets.

Aristarchus, a Grecian philosopher of Samos, one of the first that maintained that the earth turns upon its own centre. We are not sure of the age in which he lived; and have none of his works, but a Treatise of the Greatness and distance of the Sun and Moon, translated into Latin by Frederic Commandine, and published with Pappus's explanations, in 1572.

Aristarchus of Thessalonica, a primitive Christian, who attended Paul to Ephesus, where he was in danger of his life in the riot raised by Demetrius; and afterwards to Rome, where he was beheaded along with him.

ARISTEA, in botany a genus of the triandria monogynia class and order. The essential character is, petals six, style declinate, stigma funnel-shaped and gaping, capsule inferior with numerous seeds. There is one species, a native of the Cape of Good Hope.

ARISTIDA, in botany, a genus of the triandria digynia class; and, in the natural method, ranking under the fourth order, gramina. The calyx has a double valve; the corolla has one valve, and three awns at the points. There are three species of aristida, viz. 1. A. Adscensionis, a native of the island of Ascension. 2. A. Americana, a native of Jamaica. 3. A. plumosa, a native of America.

ARISTIDES was the son of Lysimachus, of the tribe of Antiochis, and residing in the village of Alopece in Attica. Like that of his great rival Themistocles, his family was comparatively mean, and there seems to have been no particular advantages of their youth to which either were indebted for their renown: unless, indeed, their constant companionship may be so regarded; for they appear to have been brought up from the age of boyhood together, and to have developed in their juvenile sports much of that spirit of personal rivalry which afterwards appeared in their history, and prompted them to such important actions. An innate integrity appeared very early in Aristides, who devoted himself to the study of the Spartan philosophy of Lycurgus. He disdained to flatter an unsteady and unwise populace; and, although an advocate for the cause of republicanism, he became a supporter of the aristocracy, and indulged perhaps an extreme contempt for the people. Truth, however, was his great object, and justice was his path; that path which, regardless of the scorns of the weak or the outcries of the wicked, he steadily trod through life. Themistocles, whose motives were those of ambition alone, chose, as might have been foreseen, the readiest way to accomplish his object, by becoming an excessive favorer of the democracy. To this side he was also inclined by his ripening jealousy of Aristides, whose reputation he hoped to destroy by the use of those means which his rival despised. The rise of this aversion between these two eminent men, or rather of the unworthy jealousy of Themistocles against Aristides, it is most important to trace, in forming a just estimate of their actions, as it became the source of great disturbances in the Athenian state, and shook at times the constitution of their country to the centre. Nevertheless, when that country was in danger from foreign tyranny, the talents of both were as warmly united in protecting it. The first, and perhaps the most eminent, occasion which presented itself in illustration of their devoted patriotism, was that invasion of Attica by the Persians, which was defeated with so much glory in the battle of Marathon. Aristides and Themistocles were both, on this occasion, amongst the ten generals who commanded the Athenian army, under Callimachus the polemarch; and both signalised their

courage and capacity before and after that celebrated conflict. Aristides was left in the chief command of those Grecians at Marathon who guarded the prisoners and the spoil. The vast treasures of the enemy now lay at his complete disposal: he was young as a commander, and well acquainted with the tempting power of gold; but his personal disinterestedness and the severity of his public justice were alike conspicuous on the occasion. Not only was the minutest part of the conquered treasure unappropriated to his own use, but he exerted every nerve to restrain the private plunder of others, considering the whole spoil as the property of the state.

The aristocracy of the city now began to regard Aristides as their wisest adviser and firm support; whilst the popular outcry was in favor of the more ostentatious merits of Themistocles. The Athenian laws permitted every citizen in his turn to preside in the courts of justice; 'The gods forbid,' said Themistocles, in regard to this office, 'that I should ever preside at a tribunal where my friends should not find more favor than strangers.' Aristides, on the contrary, held that on a seat of justice, the inflexible rule of right should alone be his guide, unbiassed by fear, by anger, or by favor. On one occasion of this sort, a plaintiff urged in favor of his suit, and in illustration of the evil dispositions of the accused, the wrongs which the defendant had committed against Aristides himself; who instantly interrupted him, and exclaimed, 'Mention your own cause, and the injuries you yourself have received; for I sit here as judge, and not as accuser; the suit is yours, and not mine.' This unbending honesty soon procured to him a title perhaps the most illustrious of all antiquity—that of THE JUST.

The tremendous democratical power afforded by the trial of ostracism, allowed Themistocles the means of ultimately ruining this great man. This summary mode of popular justice derived its name from ostracon, a tile, the votes of the citizens being at first collected by each one writing on a tile, or earthen vessel, the name of the person he wished to condemn to banishment. Every Athenian citizen possessed the extravagant power of voting for the condemnation of an individual, without any assigned reason; and if the name of any person was found to be written on six thousand tiles or shells, the sentence was confirmed by the judges, and the victim of public or private pique was expelled the republic for ten years. The chief accusation of Aristides, brought forward at the instigation of Themistocles, was that very reputation for justice and honor which the former had so nobly acquired. 'Aristides,' said the agents of Themistocles, 'has insensibly created himself a monarch, although without pomp or guards. From his great reputation for justice, he acts every day as umpire between contending parties; and what constitutes a tyrant but the giving of laws?' Upon the occasion of this trial, a story is recorded of Aristides most strongly exemplifying his philosophy, and his proud sense of internal rectitude. A clown from a village in Attica, who could neither read nor write, dazzled by the eloquence of Themistocles, advanced, during the trial, towards Aristides himself (with whose person he was unacquainted), and requested that he would mark for him the name of the accused upon his shell. Aristides, in surprise, asked the peasant of what crime that Athenian citizen had been guilty? or, 'Has he done you any personal injury?' said this illustrious patriot. 'Me injury?' replied the peasant, 'No, he has neither done me any injury, nor do I know any public harm of him; but I am quite weary with hearing every body call him the Just.' Aristides smiled, took the shell from the man, and wrote upon it, as required, his own name for condemnation. His banishment took place B. C. 484.

Aristides was recalled from his banishment on the invasion of Xerxes, when he honorably proposed to Themistocles to bury their animosities during the contest, for the good of their country, and used all his influence to second the views of his rival at the battle of Salamis. He was also of the greatest service in preserving concord among the confederates at the battle of Platæa; and after that conflict he terminated a dangerous quarrel concerning the honor of the day, by giving the palm to the Platæans, and inducing the Lacedæmonians to do the same.

At the request of Themistocles, Aristides and Xantippus were associated with him as deputies for the improvement of Athens. He told them that he proposed to widen the Pyræum port into a capacious harbour for vessels of burden, and then to join it to the city by strong and extensive walls; considering it preferable for this purpose to the other port, as being already larger, as well as farther from the city; a circumstance important to the morals and subordination of the people: and pressed upon his coadjutors the necessity of increasing the Athenian navy, if they wished to obtain any decided influence in the islands of Greece. Plutarch relates, that in this conference Themistocles communicated to Aristides a plan for burning the fleets of the confederates, as they lay at anchor in the bay of Pagasæ, in Macedonia, and thereby to render the Athenian the only naval power in Greece. Aristides, says this historian, in reference to this proposal, answered to the assembly, that in his opinion nothing could be more advantageous to the people than to pursue the advice of Themistocles, but nothing more wicked; and the scheme was therefore abandoned. The defeats at Platæa and Mycale had disabled the enemy from again invading Greece, and it was now the fortune of the confederates, in their turn, to become the assailants. The Grecian fleet, consisting of thirty galleys of Attica, and twenty belonging to Sparta and the other Peloponnesian states, were commanded by Pausanias the Lacedæmonian chieftain who had distinguished himself at Platæa.—Aristides (in conjunction with Cimon, the son of Miltiades,) commanded the Athenian fleet under him: with this force the allies invaded Cyzicus, where they took and destroyed many towns; and then proceeded to ravage Byzantium, another colony of the Persians. The imprudent conduct of the Lacedæmonian leader, on this expedition, was strikingly contrasted with the moderation and the wisdom of Aristides. Pausanias insisted upon maintaining the rigid Spar-

discipline throughout the whole fleet; and allowed no man of the confederates to receive his pay, or his ratio of provisions, until every Spartan had first been served. The authority of such a chieftain could not but prove highly irksome to the minor states, whilst the character of Aristides shone in full contrast before them; and, independently of their wishes to obey the Athenian rather than the Spartan chief, they now began to see clearly that Athens was the more powerful state by sea, while her late fortifications would enable her also to cope with Sparta by land. Impelled by these motives, the leaders of the colonists solicited Aristides to interpose his mediation with Pausanias, and to request of the Spartan a decided change of conduct: an interview between these chiefs, however, ended only in a direct insult to Aristides, from all of whose remonstrances Pausanias turned abruptly and haughtily away. The captains of the minor states now applied directly to Aristides, intreating him to receive their submission on the part of his country, and offering, if he would uphold them in their resolves, to acknowledge Athens as the principal city of Greece. Aristides, in the first instance, replied, that he saw clearly not only the fitness, but the absolute necessity of their proposition; for that the general cause of Greece could never prosper under a discipline so tyrannical as that of the Spartans. He alleged, however, that his duty forbade him to hazard the safety and the honor of Athens, by attempting that in which he had no positive assurance of support. 'Perform,' continued he, 'some public and decided act, by which you may demonstrate your sincerity; and such as may fix irretrievably your future conduct beyond the possibility of recalling it. Do this, and the protection that can be afforded by the Athenian arms is yours.' To the discontented Grecians, this declaration was rather an additional encouragement than a refusal. Uliades and Antigoras, the Samian and Chian leaders, seized an immediate occasion to run their ships against the galley of Pausanias, as she rode in the station of honor at the head of the fleet. Pausanias, in return, threatened to punish them severely for this act of insolence and rebellion to himself and to his country; but these leaders undauntedly replied, that he had better be silent with regard to them, and thank fortune for her favors at Platæa; for to her, rather than to his own talents, was even that victory owing. The remembrance of that great action only, they now declared, restrained the confederated Grecians from avenging his past tyranny; and thenceforth they renounced all obedience or submission to him. Pausanias, astonished at this unexpected boldness, had scarcely time to pursue his inquiries respecting it, when the declaration was confirmed by all the colonists, who now ranged themselves under the command of Aristides, and left the Spartan no other resource than to complain to his own countrymen. So imprudent, however, had been the conduct of this leader, that the Lacedæmonians themselves could not resent the insult, nor regain what he had lost for them.

Aristides, on his return to the capital, found himself at the very summit of popularity. But this great man foresaw that the war with Persia was likely to be of long duration, and that all the skill and resources of Athens would be required to maintain it. She had now a peculiar interest in the war, and a double honor to support—her own supremacy amongst the confederates, and her safety from the common enemy. The necessity of a regulated scheme of finance throughout the different states of Greece was therefore now evident to him; but the difficulty of accomplishing it amongst nations of such various interests, and who were agreed in no one point long together, was also but too clear. Aristides was determined, however, to devote himself to this purpose while his popularity was as high amongst his countrymen as his general reputation throughout Greece. His arguments for a regular system of finance were no sooner advanced than their truth, and the character of the party proposing them, carried conviction to all parties; and the different assessments of the several cities were left unreservedly to Aristides himself. Nor did he show himself unworthy of the power with which he had been honored. He so completely satisfied all the states with the equity of his conduct in this affair, that his taxation was emphatically named 'the happy lot of Greece.' In the conclusion of this business he persuaded the states to a solemn oath of confederation and alliance, which they readily took; Aristides himself personating his countrymen, and throwing wedges of red hot iron into the sea, while he denounced curses from all the elements against those who should ever violate the treaty.

The fame of Aristides was now complete. To the applauses of the populace he added the esteem of all Greece: Themistocles, however, could not endure the settled fame of a rival. In the adversity of Aristides or of his country, he could overlook all jealousies, and had nobly extended his hand to his competitor; but he was one of those friends whom prosperity rather tries than multiplies. He could not but feel that the origin of the popularity of Aristides was the effect of his good fortune in executing designs not his own, and which had cost Themistocles much of the pain of their conception. 'Aristides,' he exclaimed in a general assembly, 'possesses the merits, not of a man, but of a money-chest, which only preserves safely what must first be deposited.' On another occasion, he remarked to Aristides publicly, 'That it was the first excellence in a general to be able to penetrate the designs of an enemy;' to which Aristides replied, that 'This was indeed a most necessary qualification, but there appeared to him to be another of equal importance—to have clean hands, and not to be a slave to money;' a reflection which is said to have touched Themistocles to the quick, as he now began to be suspected of intrigues with the Persians.

The last public act of Aristides is found in his generous conduct towards his great rival. He expressed his decided aversion from the conduct of Cimon and Alcmæon his persecutors, who wished to bring that great man to capital punishment; and was observed, on all occasions, to speak of Themistocles with more respect than ever. It was

probably through his determined opposition to the efforts of his accusers that Themistocles was permitted to leave Athens in safety. About four years after this event Aristides died in peace and in glory, in that country to which he had devoted his whole life, and which, at length, fully repaid his sufferings and his exertions with its full confidence, and with almost unlimited power. The last testimony to his virtues is found in the recorded fact that, although he was at his decease at the summit of his prosperity, he died poor. The expenses of his funeral were defrayed by the state, and portions from the public purse were awarded to his son Lysimachus and his two daughters. Some years afterwards a grandson of Aristides was reduced to obtaining a livelihood by explaining divinations and dreams.

ARISTIDES (Ælius), a celebrated orator, born in Mysia about A. A. C. 129. The best edition of his works is that of Oxford, printed in Greek and Latin, in two volumes, 4to.

ARISTIDES, a painter, contemporary with Apelles, flourished at Thebes about the 122d olympiad. He was the first, according to Pliny, who expressed character and passion, the human mind, and its several emotions; but he was not remarkable for softness and coloring. His most celebrated picture was of an infant (on the taking of a town) at the mother's breast, who is wounded and expiring. The sensations of the mother were clearly marked, and her fear lest the child, upon failure of the milk, should suck her blood. Alexander the Great took this picture with him to Pella. Junius, in his Treatise De Pictura Veterum, conjectures that a beautiful Greek epigram of Æmilianus, of which the following is a translation, was written on this picture:—

Suck, little wretch, while yet thy mother lives,
Suck the last drop her fainting bosom gives!
She dies! her tenderness survives her breath,
And her fond love is provident in death.

ARISTIDES, a very eloquent Athenian orator, who became a convert to the Christian religion, and about the year 124 presented to the emperor Adrian an apology for the Christians, which is praised by Jerome; but nothing from the pen of this writer has reached modern times.

ARISTIPPUS, a native of Cyrene in Libya, the founder of the Cyrenaic sect of philosophers, the son of Aretades, flourished about the ninety-sixth olympiad. The great reputation of Socrates induced him to remove to Athens, that he might hear his discourses. He was chiefly delighted with those that related to pleasure; which he asserted to be the ultimate end in which all happiness consists. His manner of life was agreeable to his opinion; for he indulged himself extremely in all the luxuries of dress, wine, and women. Though he had a good estate and three country seats, yet he was the only one of the disciples of Socrates who took money for teaching; which being observed by the philosopher, he asked Aristippus, how he came to have so much; who in reply asked him, how he came to have so little. Upon his leaving Socrates, he went to Ægina, as Athenæus informs us, where he lived with more freedom and luxury than before. Socrates sent frequent exhortations to him, in order to reclaim him; but all in vain: and with the same view he published that discourse which we find in Xenophon. Here Aristippus became acquainted with Lais, the famous courtesan of Corinth; for whose sake he took a voyage to that city. He continued at Ægina till the death of Socrates, as appears from Plato's Phædon, and the epistle which he wrote upon that occasion. He returned at last to Cyrene, where he professed philosophy, and instituted a sect which was called the Cyrenaic, from the place, and the Hedonic or the voluptuous, from its doctrines. During the height of the grandeur of Dionysius the Sicilian tyrant, a great many philosophers resorted to him; and among the rest Aristippus, who was tempted by the magnificence of that court. Dionysius asking him the reason of his coming, he replied, 'That when he wanted wisdom, he went to Socrates; but now as he wanted money, he was come to him.' He soon insinuated himself into the favor of Dionysius; for, being a man of an easy temper, he conformed himself to every place, time, and person, and was a complete master of the most refined complaisance. After he had lived a long time with Dionysius, his daughter Arete sent to him, desiring his presence at Cyrene, to take care of her affairs, as she was in danger of being oppressed by the magistrates. But he fell sick in his return home, and died at Lipara an Æolian island.

Diogenes Laertius mentions several anecdotes of Aristippus during his residence at the court of Sicily. Dionysius at a feast commanded that all should put on women's purple habits, and dance in them. Plato refused, alleging it would disgrace his manhood; but Aristippus readily submitted and replied, 'At feasts, where mirth is free, a sober mind can never be corrupted.' At another time, interceding with Dionysius in behalf of a friend, but not prevailing, he cast himself at his feet; when being reproved for that excess of humility, he replied, 'That it was not he who was the cause of that submission; but Dionysius, whose ears were in his feet.' By this complaisance he gained so much upon Dionysius, that he had a greater regard for him than for all the rest of the philosophers, though he sometimes spoke with such freedom to the king, that he incurred his displeasure. When Dionysius asked, Why philosophers haunted the gates of rich men, but not rich men those of philosophers? he replied, Because the latter know what they want, and the others do not. When one recommended his son to him, he demanded 500 drachmas; and upon the father's replying that he could buy a slave for that sum, 'Do so (said he), and then you'll be master of a couple.' Being reproached, because, having a suit of law depending, he fee'd a lawyer to plead for him, 'Just so (said he), when I have a great supper to make I always hire a cook.' Being reproved by Plato for his costly feasts, 'I warrant you (said he), that you would not have bestowed three farthings upon such a dinner;' which the other confessing, 'Why, then,' said he, 'I find that I love my belly, and you love your money.' Having lost

a considerable farm, he said to one who seemed to compassionate his loss: 'You have but one field; I have three left, why should not I rather grieve for you?' Like Socrates, he rejected the sciences as they were then taught, and asserted that logic alone was sufficient to teach truth and fix its bounds. He said that pleasure and pain were the criteria by which we were to be determined; that these alone made up all our passions; that the first produced all the soft emotions, and the latter all the violent ones. The assemblage of all pleasure, he asserted, made true happiness, and the best way to attain this was to enjoy the present moment.

He wrote a great many books: particularly the History of Libya, dedicated to Dionysius; various Dialogues; and four books Of the Luxury of the Ancients. There are four of his epistles extant in the Socratic Collection published by Leo Allatius. Besides Arete his daughter, whom he educated in philosophy, Aristippus had also a son, whom he disinherited for his stupidity. Arete had a son, who was named Aristippus from his grandfather, and had the surname of Μητροδίδακτος, from his mother's instructing him in philosophy. Among his auditors, besides his daughter Arete, we have an account of Æthiops of Ptolemais, and Antipater of Cyrene. Arete communicated the philosophy which she received from her father to her son Aristippus, who transmitted it to Theodorus the atheist, who instituted the sect called Theodorean. Antipater communicated the philosophy of Aristippus to Epitimedes his disciple; Epitimedes to Parræbates; Parræbates to Hegesias and Anniceris; and these two last, improving it by some additions of their own, obtained the honor of giving a name to the Hegesiac and Annicerian sects.

ARISTO, a Stoic philosopher, the disciple of Zeno, flourished about A.A.C. 260. He differed little from his master. He rejected logic as of no use, and natural philosophy as above the reach of human understanding. It is said, that being bald, the sun burnt his head, and this caused his death. There is a saying of his recorded, which might render the doctrine of Aristippus less odious than it ordinarily is, viz. That a philosopher might do those of his hearers a prejudice who put a wrong interpretation upon good meanings; for example, that the school of Aristippus might send out debauchees, and that of Zeno, Cynics: which seems to imply, that the doctrine of this philosopher never produced this effect, but when it was misunderstood.

ARISTOBULUS I. the son of John Hyrcanus, and nephew of Judas Maccabæus, was the first king of the Jews after their return from the captivity. He was also the first who united the royal and pontifical dignities, A. M. 3845. He reigned little more than a year.

ARISTOBULUS II. the son of Alexander Jannæus king of the Jews, succeeded his brother Hyrcanus A.M. 3882, and reigned five years, when he was dethroned and Hyrcanus restored, A.M. 3887.

ARISTOC'RACY, or ARISTOC'RATY, AR'ISTOCRAT, ARISTOCRAT'ICK, ARISTOCRAT'ICAL, ARISTOCRAT'ICALLY. From αριστος strongest, chief, and κρατος, power. Aristocracy is that form of government which places the supreme power in the hands of the nobles, to the exclusion of king and people. The subsequent classification of words will be best understood from the following citations.

Ockham distinguishes, that the papacy, or ecclesiastical monarchy, may be changed in an extraordinary manner, for some time, into an *aristocratical* form of government. *Ayliffe.*

The *aristocracy* of Venice hath admitted so many abuses through the degeneracy of the nobles, that the period of its duration seems to approach. *Swift.*

Thus he, well-cautioned that in Chalcis, power
Aristocratick, both in wealth and strength,
Outweighed the people. *Glover's Athenaid.* b. xv.

A true natural *aristocracy* is not a separate interest in the state, or separable from it. *Burke.*

ARISTOCRACY is also often used for the nobility of a country, under a monarchy or any form of government. The ancient writers on politics prefer the aristocratical form of government to all others. Many of the moderns reckon it the very worst. The republic of Venice exhibited an example of a most tyrannical aristocracy, worse than even absolute despotism. Aristocracy seems to coincide with oligarchy; which, however, is more ordinarily used to signify a corruption of an aristocratical state, where the administration is in the hands of too few, or where some one or two usurp the whole power.

ARISTOCRAT or ARISTOCRATE, a nobleman; a member of the aristocracy. This is the proper and original meaning of the word; but in France, during the revolution, it was applied to all persons of whatever rank, who favored the claims of the nobility, or pleaded for a distinction of ranks in society.

ARISTOGITON, a famous Athenian, who, with Harmodius, killed Hipparchus tyrant of Athens, about A. A. C. 513. The Athenians erected a statue of him.

ARISTOLOCHIA, in botany, birthwort: a genus of the hexandria order, and gynandria class of plants; natural order, eleventh, sarmentaceæ. CAL. none: COR. one entire petal: CAP. six cells, below the flower. The species are twenty-one; but only the five following merit description: 1. A. clematitis has heart-shaped leaves, an upright stem, and the flowers crowded in the axillæ. The root is long and slender. 2. A. Indica, or contrayerva of Jamaica, is a native of that island, where its roots are used instead of the true contrayerva. It has long trailing branches, which climb upon the neighbouring plants, and sometimes rise to a considerable height. The flowers are produced in small clusters towards the upper part of the stalks, which are of a dark purple color. 3. A. longa is a native of France, Spain, and Italy. It has long tap-roots like carrots; the branches are weak and trailing, extending little more than a foot; the flowers come out from the wings of the leaves like the other, are of a pale purple color, and are frequently succeeded by seed-vessels like the other. 4. A. ro-

tunda, is also a native of the south of France, Spain, and Italy, from whence the roots are brought for medicinal use. 5. A. serpentaria is a native of Virginia and Carolina, from whence the radix serpentaria, or snake-root, so much used in medicine, is brought over.

The last three species are propagated from seeds which should be sown in the autumn, in pots filled with light fresh earth, and placed under a frame to preserve them from frost. If they are plunged into a gentle hot-bed in the month of March, the plants will come up the sooner. In summer and in autumn, when the stalks begin to decay, they must be watered. In winter they must be again sheltered; and in March, before the roots begin to shoot, they must be transplanted into small separate pots filled with light earth, when they may be removed into the open air, and treated as before. The next spring they may be planted in the open air in a warm border; where, in autumn, when their stalks decay, if the border is covered with old tanners' bark to keep out the frost, the roots will be secured; but without this they will frequently be killed by the frost. The Indica is tender, and therefore must be kept in a stove during the winter, or it will not live in England.

The roots of the long and round sorts, on being first chewed, scarcely discover any taste, but in a little time prove nauseously bitter; the long somewhat less. The root of the clematitis is long and slender, rarely exceeding the thickness of a goose-quill: it instantly fills the mouth with an aromatic bitterness, which is not ungrateful. Their medical virtues are to heat, stimulate, attenuate viscid phlegm, and promote the fluid secretions in general: they are principally celebrated in suppressions of female evacuations. The dose is in substance from a scruple to two drams. The long sort is recommended externally for cleansing and drying ulcers and wounds, and in cutaneous diseases. The root of the serpentaria is small, light, bushy, and consists of a number of strings or fibres matted together, issuing from one common head; of a brownish color on the outside, and paler or yellowish within. It has an aromatic smell, like that of valerian; but more agreeable, and a warm, bitterish, pungent taste. This root is a warm diaphoretic and diuretic; it has been greatly celebrated as an alexipharmic, and esteemed one of the principal remedies in malignant fevers and epidemic diseases. In these intentions it is given in substance from ten to thirty grains; and in infusion, to a dram or two Both watery and spirituous menstrua extract its virtue by infusion, and elevate some share of its flavor in distillation; along with the water a small portion of essential oil arises. These articles, however, are now little esteemed; and are all banished from the Pharmacopœia of the London college: the clematitis is alone retained in that of Edinburgh.

ARISTOPHANES, a celebrated comic poet of Athens, was contemporary with Plato, Socrates, and Euripides. According to some writers he was a Rhodian by birth, the son of Philip of Rhodes, and was born about B. C. 460. Others state that he was a native of Ægina, a small island opposite to Athens; and all agree that he was not born an Athenian, though domiciliated there in early life. Plutarch informs us that his rights as an Athenian citizen being called in question by Cleon, a commission was appointed to try the question, and gave a solemn judgment in his favor. Plutarch does not state the grounds of this decision, but relates a characteristic anecdote of Aristophanes on this occasion, which attributes his success to a bon-mot. Parodying two simple lines of Homer, he addressed the judges with great gravity—

Je suis fils de Philippe, à ce que dit ma mere :
Pour moi je n'en sçai rien. Qui sçait quel est son pere ?

I am the son of Philip; at least, so says my good mother.
Who in the name of heaven ever knew his father!

a witticism, says Brumoy, worth as much to Aristophanes, as the eloquent harangue of Cicero in favor of the poet Archias, upon a similar occasion. Most of his plays were written during the Peloponnesian war. His imagination was warm and lively, and his genius particularly turned to raillery. He had also great spirit and resolution; and was a declared enemy to slavery and to all who wished to oppress their country. The Athenians, in his time, were governed by men who had no other views than to make themselves masters of the commonwealth. Aristophanes exposed their designs with great wit and severity upon the stage. Cleon was the first whom he attacked in his comedy of the Equites; and as none of the comedians would venture to personate a man of his great authority, Aristophanes played the character himself, and with so much success that the Athenians obliged Cleon to pay a fine of five talents, which were given to the poet. He described the affairs of the Athenians in so exact a manner that his comedies are a faithful history of that people. When Dionysius king of Syracuse desired to learn the state and language of Athens, Plato sent him the comedies of Aristophanes, telling him these were the best representations of them. To Plato is ascribed the following beautiful epigram on our poet:

Αι χαριτες τεμενος τι λαβειν, οπερ ηχι πεσειται,
Ζητησαι ψυχην ευρον Αριστοφανες.

The graces in search of a temple which could never fall, found thy tuneful breast, Aristophanes!

He wrote above fifty comedies, but only eleven are extant, which are complete: viz. Plutus, the Clouds, the Frogs, Equites, the Acarnenses, the Wasps, Peace, the Birds, the Ecclesiazusæ or Female Orators, the Thesmophoriazusæ or Priestesses of Ceres, and Lysistrata. The Clouds, which he wrote in ridicule of Socrates, is the most celebrated of all his comedies. Madam Dacier tells us, that she was so much charmed with this performance, that after she had translated it and read it over 200 times, it did not become in the least tedious to her, which she could not say of any other piece; and that the pleasure which she received from it was so exquisite, that she forgot all the indignation which Aristophanes deserved for employing his wit to ruin a man who was wisdom itself, and

the greatest ornament of Athens. St. Chrysostom thought so highly of his style that he always slept with his works under his pillow. Aristophanes having some aversion to the poet Euripides, satirised him in some of his plays, particularly in his Frogs and his Thesmophoriazusæ. He wrote his Peace in the tenth year of the Peloponnesian war, when a treaty for fifty years was concluded between the Athenians and the Lacedæmonians, though it continued but seven years. The Acarnenses was written after the death of Pericles, and the loss of the battle in Sicily, in order to dissuade the people from entrusting the safety of the commonwealth to such imprudent generals as Lamachus. Soon after he represented his Aves, or Birds, by which he admonished the Athenians to fortify Decelæa, which he calls by a fictitious name, Nephelococcygia. The Vespæ, or Wasps, was written after another loss in Sicily, which the Athenians suffered from the misconduct of Chares. He wrote the Lysistrata when all Greece was involved in a war; in which comedy the women are introduced debating upon the affairs of the commonwealth; when they come to a resolution not to go to bed with their husbands till a peace should be concluded. His Plutus, and other comedies of that kind, were written after the magistrates had given orders that no person should be exposed by name upon the stage. Athenæus asserts that he was so decided a votary of Bacchus, as always to have been in a state of intoxication when he composed. He invented a peculiar kind of verse which was called by his name, and is mentioned by Cicero in his Brutus: Suidas says he was also inventor of the tetrameter and octameter verse. Aristophanes was greatly admired among the ancients, especially for the true Attic elegance of his style. The time of his death is unknown; but he was living after the expulsion of the tyrants by Thrasybulus, whom he mentions in his Plutus and other comedies. There have been several editions and translations of his works. Nicomedus Frischlin, a German, famous for his classical knowledge, in the sixteenth century translated Plutus, the Clouds, the Frogs, the Equites, and the Acarnenses, into Latin verse. Quintus Septimus Florens also rendered into Latin the Wasps, the Peace, and Lysistrata, but his translation is full of obsolete words and phrases. Madame Dacier published at Paris in 1692 a French version of Plutus and the Clouds, with critical notes, and an examination of them according to the rules of the theatre. The best editions of Aristophanes are those of Kuster, Amsterdam, 1710, fol.; Bergler, 1760, two vols. 4to.; Brunck, Strasburg, 1783, three vols. 8vo.; Invernizi, Leipsic, 2 vols. 8vo., 1794. An English version of the Clouds has been published by Cumberland, and some of his other comedies more recently by Mitchell, and the Birds by Mr. Carey.

ARISTOTELIANS, a sect of philosophers called also Peripatetics. The Aristotelians and their dogmata prevailed long in the schools and universities; even in spite of all the efforts of the Cartesians, Newtonians, and other corpuscularians. But the systems of the latter have at length gained the preeminence; and the Newtonian philosophy in particular is now generally received. The principles of Aristotle's philosophy the learned agree, are chiefly laid down in his four books De Cælo; his eight books of Physical Auscultation, φυσικης ακροασεως, belonging rather to logics, or metaphysics, than to physics. Instead of the more ancient systems, he introduced matter, and form, and privation, as the principle of all things; but he does not seem to have derived much benefit from them in natural philosophy. His doctrines are for the most part so obscurely expressed, that it has not yet been satisfactorily ascertained what were his sentiments on some of the most important subjects. He attempted to refute the Pythagorean doctrine concerning the two-fold motion of the earth; and pretended to demonstrate that the matter of the heavens is ungenerated, incorruptible, and subject to no alteration; and he supposed that the stars were carried round the earth in solid orbs. The reader will find a distinct account of the logical part of his philosophy, by Dr. Reid, professor of moral philosophy in the university of Glasgow, in Lord Kames's Sketches of the History of Man, vol. ii. and Mr. Harris has published a sensible commentary on his Categories, under the title of Philosophical Arrangements.

ARISTOTLE, the chief of the peripatetic philosophers, born at Stagira, a small city of Macedon, in the ninety-ninth Olympiad, about 384 years before the birth of Christ. He was the son of Nicomachus, physician to Amyntas, the grandfather of Alexander the Great. He lost his parents in his infancy; and Proxenes, a friend of his father's, who had the care of his education, taking but little notice of him, he quitted his studies and gave himself up to the follies of youth. After he had spent most of his patrimony he entered into the army; but not succeeding in this profession he went to Delphos to consult the oracle what course he should follow, when he was advised to go to Athens and study philosophy. He accordingly went thither about eighteen years of age, and studied under Plato till he was thirty-seven. By this time he had spent his whole fortune; and we are told that he got his living by selling powders and some receipts in pharmacy. He followed his studies with most extraordinary diligence, so that he soon surpassed all in Plato's school. He eat little and slept less, and that he might not oversleep himself, Diogenes Laertius tells us, that he lay always with one hand out of the bed, having a ball of brass in it, which, by its falling into a basin of the same metal, awaked him. He had several conferences with a learned Jew at Athens, who instructed him in the sciences and religion of the Egyptians, and thereby saved him the trouble of travelling into Egypt. When he had studied about fifteen years under Plato, he began to form different tenets from those of his master, who became highly piqued at his behaviour. Upon the death of Plato he quitted Athens and retired to Atarnea, where he married Pythias the sister of Hermias, prince of Mysia; whom he is said to have loved so passionately that he offered sacrifice to her. Some time after, Hermias having been taken prisoner by Memnon the king of Persia's general, Aristotle went to Mitylene the capital of Lesbos, where he remained

till Philip king of Macedon having heard of his great reputation, sent for him to be tutor to his son Alexander, then about fourteen years of age: Aristotle accepted the offer; and in eight years taught him rhetoric, natural philosophy, ethics, politics, and a certain sort of philosophy, which, says Plutarch, he taught nobody else. Philip erected statues in honor of Aristotle; and for his sake rebuilt Stagira, which had been almost ruined by the wars. The last fourteen years of his life he spent mostly at Athens, surrounded with every assistance which men and books could afford him for prosecuting his philosophical enquiries. The glory of Alexander's name insured tranquillity and respect to the man whom he distinguished as his friend; but after his death, the invidious jealousy of priests and sophists inflamed the superstitious fury of the Athenian populace: to avoid whose persecution he withdrew to Chalcis. He seems to have survived his retreat from Athens only a few months; vexation and regret probably ended his days.

Besides his treatises on philosophy, he wrote also on poetry, rhetoric, law, &c. to the number according to Diogenes Laertius, of 400 treatises. An account of such as are extant, and of those said to be lost, may be seen in Fabricius's Bibliotheca Græca. He left his writings with Theophrastus, his beloved disciple and successor in the Lycæum, and forbade that they should ever be published. Theophrastus, at his death, trusted them to Neleus his friend and disciple, whose heirs buried them in the ground at Scepsis a town of Troas, to secure them from the king of Pergamos, who made great search everywhere for books to adorn his library. Here they lay concealed 160 years, until, being almost spoiled, they were sold to one Apellicon a rich citizen of Athens. Sylla found them at this man's house, and ordered them to be carried to Rome. They were some time after purchased by Tyrannion a grammarian; and Andronicus of Rhodes having bought them of his heirs, was the first restorer of the works of this great philosopher; for he repaired what had been decayed, and got them copied.

Many followed the doctrine of Aristotle in the reigns of the twelve Cæsars, and their numbers increased much under Adrian and Antoninus. Alexander Aphrodinus was the first professor of the Peripatetic philosophy at Rome, being appointed by the emperors Marcus Aurelius and Lucius Verus; and in succeeding ages the doctrine of Aristotle prevailed among almost all men of letters, and many commentaries were written upon his works. The first doctors of the church disapproved of the doctrine of Aristotle, as allowing too much to reason and sense; but Anatolius bishop of Laodicea, Didymus of Alexandria, St. Jerome, St. Augustin, and several others, at last wrote and spoke in favor of it. In the sixth century Boethius made it known in the west, and translated some of his pieces into Latin. But from the time of Boethius to the eighth age, Joannes Damascenus was the only man who made an abridgment of his philosophy, or wrote any thing concerning him. The Grecians, who took great pains to restore learning in the eleventh and following centuries, studied much the works of this philosopher, and many learned men wrote commentaries on his writings, amongst these were Alfaragius, Algazel, Avicenna, and Averroes. They taught his doctrine in Africa, and at Cordova in Spain. The Spaniards introduced it into France, with the commentaries of Averroes and Avicenna; and it was taught in the university of Paris, until Amouri, having supported some particular tenets on the principles of this philosopher, was condemned of heresy, in a council held there in 1210, when all the works of Aristotle that could be found were burnt, and reading of them forbidden under pain of excommunication. This prohibition was confirmed, as to the physics and metaphysics, in 1215, by the pope's legate; though at the same time he gave leave for his logic to be read, instead of St. Augustin's, used at that time in the university. In 1265 Simon, cardinal of St. Cecil, and legate from the holy see, prohibited the reading of the physics and metaphysics of Aristotle. All these prohibitions, however, were taken off in 1366; for the cardinals of St. Mark and St. Martin, who were deputed by Pope Urban V. to reform the university of Paris, permitted the reading of those books which had been prohibited; and in 1448 Pope Stephen approved of all his works, and procured a new translation of them into Latin.

ARISTOXENUS, the most ancient musical writer, of whose works any tracts are come down to us, was born at Tarentum. He was the son of a musician, whom some call Mnesias, others Spintharus. He had his first education at Mantinæa, under his father, and Lamprus of Erythræ; he next studied under Xenophilus the Pythagorean; and lastly under Aristotle, in company with Theophrastus. Suidas adds, that Aristoxenus, enraged at Aristotle having bequeathed his school to Theophrastus, traduced him ever after. But Aristocles the Peripatetic, in Eusebius, exculpates Aristoxenus, and assures us that he always spoke with great respect of Aristotle. Aristoxenus lived under Alexander the Great and his first successors. His Harmonics in three books (all that have reached us), together with Ptolemy's Harmonics, were first published by Gogavinus at Venice in 1562, 4to. with a Latin version. John Meursius next translated these three books into Latin from the MS. of Joseph Scaliger. With these he printed at Leyden, in 1616, 4to., Nicomachus and Alypius, two other Greek writers on music. Meibomius collected these musical writers together; to which he added Euclid, Bacchus senior, and Aristides Quintilianus; and published the whole, with a Latin version and notes, from the elegant press of Elzevir, Amst. 1652, and dedicated them to Christina queen of Sweden. Aristoxenus is said by Suidas to have written 452 different works, among which those on music were the most esteemed; yet his writings on other subjects are frequently quoted by ancient authors, notwithstanding Cicero and others say he was a bad philosopher, and had nothing in his head but music. The titles of several of the lost works of Aristoxenus, quoted by Athenæus and others, have been collected by Meursius in his notes upon this author, by Tonsius and Menage, all which Fabricius had digested into alphabetical order.

ARITHMETIC.

ARITH'METICK, ARITHMET'ICAL, ARITHMET'ICALLY, ARITHMETIC'IAN. } Gr. *αριθμος*, number. See the science of arithmetic as a branch of mathematics.

On fair ground I could beat forty of them,
But now 'tis odds beyond *arithmetick*.
Shakspeare. Coriolanus.

The Christian religion, according to the apostle's *arithmetick*, hath but these three parts of it; sobriety, justice, religion. *Bishop Taylor.*

The principles of bodies may be infinitely small, not only beyond all naked or assisted sense, but beyond all *arithmetical* operation or conception. *Grew.*

The squares of the diameters of these rings, made by any prismatick color, were in *arithmetical* progression, as in the fifth observation. *Newton.*

ARITHMETIC; from the Greek *αριθμητικη*, sub. *τεχνη*; is the science of numbers. The following remarks may be conveniently arranged under the heads of GENERAL THEORY OF NUMERATION; HISTORY OF THE SCIENCE; PRACTICAL ARITHMETIC; COMMERCIAL ARITHMETIC; and EVOLUTION and INVOLUTION.

GENERAL THEORY OF NUMERATION.

1. The power of enumeration, like the other capabilities of the mind which are most required for the purposes of social life, is put in action, and is developed with facility; both from the aptitude with which numerical truths are perceived, and from the perpetual presentation to the sight of objects giving rise to the ideas of number. This facility is the principal cause of the difficulty which is found in tracing the history of the science of arithmetic; for, as it has probably originated from a multitude of sources, the objects of attention become perpetually more subdivided the higher we ascend. Nor does the manner in which the science has been treated by different nations at all coincide. And it is difficult to collect the general properties, and separate them from the different arbitrary forms which have been given to them by the different races of the earth.

2. In all languages words are found to express the ideas which we denote by the words, *one*, *two*, *three*, &c. These words are simple and uncompounded; but it is found that the number of simple words denoting the ideas of numbers is not very great in any language. Nor is it possible to retain, without assistance, the idea of the number of a large collection of objects. We find, accordingly, that the system of classification has been universally adopted. By grouping the objects together, the objects of attention are rendered fewer; and consequently the idea of the number of objects is more easily retained, as well as more easily expressed.

3. The simplest mode of classifying is by *pairs*; it has also probably been the earliest. Its former existence is testified by words which, like our *brace* and *couple*, are now confined to particular occupations. The practice of reckoning by three's has been adopted, although not to the same extent; it has been preserved in the term *leash*, meaning the string by which three dogs can be held in the hand. Fishermen frequently reckon by four's, and each double pair is named by them a *throw* or *cast*. The term *warp* also denotes, in various trades, a collection of four articles.

4. But although it is easier to enumerate thirty objects, for example, by pairs, and to remember the number of the pairs, than to number each object separately, and to remember the number of the whole; and yet easier to enumerate them by leashes, and still easier by warps; yet none of these methods materially facilitates the numeration of a much larger number of objects. It becomes therefore necessary again to employ the same process, and to collect the *pairs* into *pairs*, or the *leashes* into *leashes*, or the *warps* into *warps*. In this manner, if we were to take twenty-five pebbles, and take all the pairs out of them which could be made, we should find twelve pairs of pebbles, and one over:

.. ..

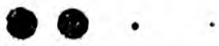
We might then suppose each pair to be replaced by a pebble of a larger size, and these to be again collected into pairs, thus:

.. ..

Let us now replace each of these pairs by a pebble of a size yet larger than the former, and let these be again collected into pairs, thus:

● ● ● ● ● ● ·

And if we again perform the same process, using pebbles of a yet larger size, we shall represent the number nineteen in the following manner:



And again substituting for the last pair a larger pebble, the number will be thus expressed:

The number 21 is therefore denoted by one counter of the fifth order; one of the third, and one of the first. It is plain that any number may be treated in exactly the same manner, if three, four, five, &c. pebbles be replaced by pebbles of a larger size, and so on until the whole number is analysed.

In order, however, to perform this operation with greater rapidity, where large numbers are to be enumerated, a greater number of counters of one size, as ten or twenty, must be replaced by a counter of the next greater size; and this process may perhaps be styled, with propriety, the first and most simple system of notation. It is to be remarked, that the terms binary, ternary, quaternary, quinary, senary, septenary, octary, nonary, denary, and duodenary scales, are applied to the systems in which 2, 3, 4, 5, 6, 7, 8, 9, 10, or 12 of the counters of

inferior denomination are replaced by the next in magnitude.

6. The next step, and it is a very important one, is to make the value of the counters depend, not upon their size, but upon the places which they occupy. That is to say, if we decompose numbers by perpetually pairing as before, on this system we must reckon the value of a counter doubled by being removed from one place to the next in order above it. If we therefore determine that the counters shall increase in value from the right hand towards the left, the number 21 would be thus represented :—

It is evident that the mode of decomposing a number on this system will be the same as in the last method ; only, instead of perpetually replacing the pairs by counters of larger size, we must continue to replace them by counters of the same size, but removed to the next place. In the same manner any number may be decomposed on the ternary, quaternary, quinary, senary, or any other scale.

7. This mode of numeration appears to possess great practical advantages ; it was practised by the most polished nations of antiquity, and was decidedly the most powerful instrument of calculation which they possessed. And, although in Europe its use has been superseded by more convenient and expeditious notation, it is still used, as it has been used for ages, by the Chinese nation. The extension of the same method to fractions is easy ; but, as the rules for reducing numbers from one scale of notation to another will be given in the article scales of notation, it will not be necessary to enlarge farther on this subject, especially as such investigations are of no practical utility, and only derive their value from giving a more correct and extended view of the science of numeration, than can be obtained by any other method.

8. The most important step was now to express by words, and by characters, the various collections of numbers which had been contemplated in the mode above described. These methods of expressing numbers must, however, be supposed to have originated, in a great degree, at the same time with the science ; exactly as we see language constantly extending itself with the extension of the sciences to which it is applied. Having thus given an outline of the general principles of numeration, we shall proceed to give a concise account of the most authentic historical notices with respect to the history of the science of arithmetic.

History of Arithmetic.

9. It appears from the accounts of various travellers, that there are scarcely any tribes of savages so unacquainted with the properties of numbers, as not to have attained to what has, in the preceding section, been termed the first stage in the science of numeration, although there are many who are unable to go beyond it. As it therefore appears to be a method immediately and imperatively pointed out by nature, rather than discovered by an effort of individual genius, it can in no way require the attention of history.

10. The next stage, viz. that in which the objects by which numeration is effected are increased or diminished in value according to the place which they occupy, has been attained only by nations who have made considerable advances in civilisation. The Greek nation is the first European nation which we know with certainty to have used it, and of whom we know with precision how they used it. From them it was transmitted to the Romans ; and, after the ruin of that empire, it was amongst those arts which survived, in the subject provinces, the fall of the power which had introduced them.

11. In order to manage this sort of numeration with facility, the Greeks invented the αβαξ. It was probably merely intended to supersede the necessity of ruling lines on which the counters must be placed every time an arithmetical operation was to be performed. It consisted of a square surface adapted to the reception of beads or counters, in such a manner as to preserve them always in parallel straight lines, whilst it admitted a smaller or greater number of counters upon each. It is easy to conceive how arithmetical operations might be performed upon an instrument of this nature ; and it would probably be found, after some practice, not to yield much in rapidity to our modern system, at least where the numbers were not very large. It may be observed, that the derivation of the word αβαξ has been ingeniously deduced from the three first letters of the Greek alphabet, **A**, **B**, **Γ** ; from the circumstance of the board, similar in shape, being used to teach the letters of the alphabet.

12. From the Greeks the Romans received the αβαξ, and the name of abacus. Operations were performed on this instrument in exactly the same manner as by the Grecians ; and it appears to have spread with the conquest of the Roman arms into every province of the empire. It may here be remarked, that the Romans, as well as the Greeks, proceeded according to the denary system. The use of the abacus is, however, by no means confined to this system, and it is probable, from the figure of some abaci, as discovered on antique monuments, that they had a contrivance, by means of which they could be adapted to the duodenary scale ; for, according to this system, the Roman *as*, the *jugerum*, and the *pes*, were divided. With regard to the mode of using this instrument, it is sufficient to remark that arithmetical operations were performed upon it in exactly the same manner as we are now accustomed to perform them with figures, except that, instead of making a mark expressive of a number, they actually placed the number upon the proper row of the abacus, reckoning each part of ten times the value of the one below it : and, instead of carrying as many units to the next figure as there may be tens contained in the number, they would actually add to the counters on the bar of the higher denomination, as many counters as there might be tens contained in the number of counters of the lower denomination. Those who wish to become more accurately acquainted with this curious in-

strument, we shall refer to Mahudel, in Histor. Academ. R. Inscr. tom. iii. p. 390; and the Phil. Trans. No. 180.

13. After the fall of the Roman power, the use of the abacus, as has been before observed, was continued amongst most European nations. It took, however, the form of a board divided into a number of small squares, on which the counters were placed; thus the term scaccarium, from which was derived the French eschequier, and thence the English exchequer, anciently signified merely a chess-board, being formed from scaccum, denoting one of the movable pieces in that intricate game. The reason of this application of the term is sufficiently obvious. The table for accounts was, to facilitate the calculations, always covered with a cloth resembling the surface of the scaccarium or abacus.

14. In order to give some idea of the mode in which arithmetic was practised in the middle ages, we shall give an account of this court as it is described by Richard Fitz-Nigel, a writer who lived about the middle of the twelfth century, about 200 years after its introduction by the Norman conquest. He describes the scaccarium as a quadrangular table, about ten feet long and five feet broad, with a ledge or border about four inches high, to prevent any thing from rolling over. It was surrounded on all sides by seats for the judges, the tellers, and other officers. It was covered every year, after the term of Easter, with fresh black cloth, divided by perpendicular white lines at intervals of about a foot, and again parted by similar transverse lines. In reckoning, they proceeded, he says, according to the rules of arithmetic, using small coins for counters. The lowest bar exhibited pence, the one above it shillings, the next pounds; and the higher bars denoted successively tens, twenties, hundreds, thousands, and ten thousands of pounds; though, in those early times, it very seldom happened that so large a sum as the last ever came to be reckoned. The first bar, therefore, advanced by dozens; the second and third by scores, and the rest of the stock of bars by the multiples of ten. The teller sat about the middle of the table; on his right hand eleven pennies were heaped on the first bar, and a pile of nineteen shillings on the second; while a quantity of pounds was placed opposite to him on the third bar. For the sake of expedition he might employ a different mark to represent half the value of any bar, a silver penny for ten shillings, and a gold penny for ten pounds.

15. In early times a chequered board, the emblem of calculation, was hung out, to indicate an office for changing money. It was afterwards adopted as the sign of an inn or hostlery, where victuals were sold, or strangers lodged and entertained. We may perceive traces of this ancient practice existing even at present. It is customary in London, and in some provincial towns, to have a chequer, diced with red and white, painted against the sides of the door of a chop-house.

16. It only remains to remark, that in China, a country which appears to have early attained a high degree of civilisation, and then to have stopped short in the career of improvement, this method of calculation is still used, and has been in use almost from time immemorial. The swan-pan, the instrument used by the Chinese, does not differ essentially from the Grecian αβαξ, and is used in a very similar manner.

Figurative Arithmetic.

17. It is probable that the use of signs to represent numbers was prior to the introduction of written language. The most ancient figures with which we are acquainted, are probably the Roman; they appear to have been introduced into Italy by the Grecian colonies, and continued in use, with little alteration, during many centuries. The simple strokes I II III were repeated continually till the reckoner reached ten. The first class was now completed, and to intimate this the carver threw a dash across the stroke, or common unit; that is, he employed two decussating strokes X to denote ten. It has further been conjectured, that the mark C, originally ⊏, representing a hundred, and the mark M for a thousand, were formed on the same principle. Proceeding on the denary system, every time a period was completed another stroke was added.

18. But the division of these marks afterwards furnished characters for the intermediate numbers, and hence greatly shortened the repetition of the lower ones. Thus, having parted in the middle the two decussating strokes X denoting ten, either the under half Λ, or the upper half V, was employed to signify five. Next, the mark ⊏ for an hundred, consisting of a triple stroke, was divided into ⌐ and ⌊, either of which represented fifty. Again, the four combined strokes M, which originally formed the character for a thousand, afterwards assumed a rounded shape (ↀ), frequently expressed thus, CIↃ. This last form, by abbreviation on either side, gave two portions cI and IↃ to represent five hundred.

19. This was the limit of numeration among the early Romans; but, in the progress of refinement, they repeated the symbols of a thousand to denote the higher terms of the denary scale. Thus, cc IↃↃ was employed to represent ten thousand, and ccc IↃↃↃ to signify an hundred thousand. Again, each of these being divided gives IↃↃ for five thousand, and IↃↃↃ for fifty thousand. These characters, however, were often modified and abbreviated in monumental inscriptions. By drawing a horizontal line over the letters, their value was augmented one thousand times.

20. It was also customary with them, for the sake of abbreviation, to reckon partly backwards. Thus, instead of octodecim and novemdecim, the words for eighteen and nineteen, they frequently used duodeviginti and undeviginti, as more elegant and expressive. This practice led to the application of deficient numbers; an improvement scarcely to be expected from a people so little noted for invention. Instead of writing nine, thus VIIII, by joining four to five, they counted one back from ten, or placed I before X. In the same way they represented forty,

and four hundred, ninety, and nine hundred, by XL, and CD, XC, and CM

21. The Chinese, like the Roman characters, are formed by first representing the first ten numbers, and then deriving the higher numbers by modifying the form of the original characters. This notation is equally complete with the Roman; and, although more complicated, it does not require so many characters to express large numbers.

22. The Greeks, after having communicated to the founders of Rome the elements of the numeral characters, which are still preserved, again exercised their inventive genius in framing new systems of notation. Discarding the simple original strokes, they sought to draw materials of construction from their alphabet. They had no fewer than three different modes of proceeding: 1. The letters of the alphabet, in their natural succession, were employed to signify the smaller ordinal numbers. In this way, for instance, the books of Homer's Iliad and Odyssey are usually marked. 2. The first letters of the words for numerals were adopted as abbreviated symbols. Thus, employing capitals only, I being retained as before to denote one; the letter Π of ΠΕΝΤΕ marked five; the Δ of ΔΕΚΑ denoted ten; the H of ΕΚΑΤΟΝ, anciently written ΗΕΚΑΤΟΝ, expressed an hundred; the X of ΧΙΑΙΑ, a thousand; and the letter M of the word ΜΥΡΙΑ, represented ten thousand.

23. A simple and ingenious device was used for denoting the powers of those symbols; a large Π over any letter made it signify five thousand times more. Thus, $\overline{|\Delta|}$ denoted fifty thousand, and $\overline{|H|}$ five hundred thousand. 3. A mighty stride was made in numerical notation by the Greeks, when they distributed the twenty-four letters of their alphabet into three classes, corresponding to units, tens, and hundreds. To complete the symbols of the nine digits, an additional character was introduced into each class. The mark ϛ, called *επισημον*, was inserted among the units, immediately after ε, the letter denoting five; and the koppa and sanpi, represented by Ϟ, ϡ, or Ϡ, terminated respectively the range of tens and of hundreds, or expressed ninety and nine hundred. This arrangement of the symbols, it is obvious, could extend only to the expression of nine hundred and ninety-nine; but, by subscribing an iota under any character, the value was augmented a thousand fold, or by writing the letter M, or the mark for a myriad, or ten thousand, under it, the effect was increased ten times more. This last modification was sometimes more simply accomplished by placing two dots over the character.

24. It would extend this article beyond its proper limits, to detail the method of performing calculations with numbers expressed by this notation. Although much superior to the Roman, its operations are tedious and intricate, especially in its application to fractions.

25. It was to remedy these inconveniences, and more especially the latter, that Ptolemy introduced the sexagesimal arithmetic. Every unit was supposed to be divided into sixty parts, and each of these into sixty others, and so on: hence any numbers of such parts were called sexagesimal fractions; and to make the computation in whole numbers more easy, he made the progression in these also sexagesimal. Thus, from one to fifty-nine were marked in the common way; then sixty was called a sexagesima prima, or first sexigesimal integer, and had one single dash over it; so 60 was expressed thus, I′; and so on to 59 times 60, or 3540, which was thus expressed, LIX′. He now proceeded to 60 times 60, which he called a sexagesima secunda, and was thus expressed I″. In like manner, twice 60 times 60, or 7200, was expressed by II″; and so on till he came to 60 times 3600, which was a third sexagesimal, and expressed thus, I‴. If any number less than sixty was joined with these sexagesimals, it was added in its proper characters without any dash; thus I′XV represented 60 and 15, or 75; IV′XXV is four times 60 and 25, or 265; X″II′XV is ten times 3600, twice 60 and 15, or 36,135, &c. Sexagesimal fractions were marked by putting the dash at the foot, or on the left hand of the letter; thus $I_{,}$ or $'I$, denoted $\frac{1}{60}$; $I_{,,}$ or $''I$, $\frac{1}{3600}$, &c.

26. By the introduction of this method many valuable advantages were obtained. The astronomers of Alexandria and Constantinople continued to employ it in all their calculations, and were afterwards imitated by succeeding observers among the Arabians and Persians. The mode of working sexagesimals had thus become generally known, and reduced to practice; but we owe the first distinct treatise on those fractions to Barlaam a Calabrian monk, who was the friend and Greek preceptor of Petrarch, and a man of learning and vigorous intellect.

27. About the middle of the fourteenth century, the most important and ultimate improvement was conferred on the science of numeration by the introduction of the Arabic numerals. The most important part of this system is the circumstance that the value of each figure is made to depend on the place in which it stands. This discovery, of which the simplicity is not more convenient than its effects are astonishing, is undoubtedly due to the Arabs. The time of its introduction into Europe cannot be fixed with precision. One of the oldest authentic dates thus written, is in the hand-writing of the famous Petrarch, on a copy of St. Augustine. The use of these characters had then began to spread in Europe, but was still confined to men of learning. We shall conclude these remarks by observing, that the advantages derived from this system are not the consequences of its having for radix the number ten, as some have imagined. On the contrary, the very inferior systems of the Greeks and Romans were equally denary. The grand principle is, as before stated, that of giving a value to the figures according to the place which they occupy. The cipher, the use of which has also been extolled as the most important point of the Arabic notation, is only useful in as far as it serves to determine the proper places, and consequently the values of the figures. The same advantages would be produced if, instead of using a cipher, a space were left; but the use of the cypher preserves the uniformity, and perspicuity of the notation.

Notation and Numeration.

28. Notation is the expressing of any proposed number either by words or characters. All numbers are expressible by these ten characters or figures: 1 2 3 4 5 6 7 8 9 0

One, two, three, four, five, six, seven, eight, nine, cipher. The nine first are called *digits*. When placed singly they denote the simple numbers subjoined to the characters; and the value of any character is increased in a tenfold proportion, for every place it is removed to the left, among the other figures with which it is connected. Thus, in these figures 333, the first 3 (reckoning from the right to the left) is 3 ones; the second is 3 tens, and the third is 3 hundreds; in these 2759, the 9 represents 9 ones, and the 5 represents 5 tens, the 7 is 7 hundreds, and the 2 is 2 thousand. And although the cipher signifies nothing by itself, yet when put on the right of any of the other figures, it increases their value tenfold, merely by changing their position from the place of units to that of tens. Thus, though 2 standing alone, or in the first place, represents only two ones, yet when a cypher is written on the right of it thus, 20, it represents two tens, or twenty; and if another cipher be affixed thus, 200, it will represent two hundreds, &c.

29. Numeration is the reading or writing of any proposed sum or number by means of figures. For the more easy numbering, and expeditious reading of large numbers, when they are expressed by figures, they are divided from the right hand towards the left into periods and half periods, each period consisting of six figures; the common name of the first period being units, or ones; of the second, millions; of the third, billions; of the fourth, trillions, &c. Also the first half of any period is so many ones of it, but the latter half is so many thousands of it. The following example exhibits a summary of this whole doctrine, and may be extended to sextillions, septillions, octillions, nonillions, &c. ad infinitum.

Quintillions.			Quadrillions.			Trillions.			Billions.			Millions.			Units.		
Hundred thousands,	Ten thousands,	Thousands,	Hundreds,	Tens,	Units.	Hundred thousands,	Ten thousands,	Thousands,	Hundreds,	Tens,	Units.	Hundred thousands,	Ten thousands,	Thousands,	Hundreds,	Tens,	Units.	Hundred thousands,	Ten thousands,	Thousands,	Hundreds,	Tens,	Units.
9	8	7,	6	5	4,	3	2	1,	9	8	7,	6	5	4,	3	2	1,	9	8	7,	6	5	4,	3	2	1

30. A number expressing a quantity of one name or denomination, is called a simple number, as 20 pounds, or 17 gallons, or 5 days; and that representing a quantity of several names is called a compound number, as 13 pounds 5 shillings and 6 pence, or 17 gallons and 2 pints, or 3 hours and 50 minutes.

The following rules for performing calculations with the Arabic or modern notation, are divided into four sections. The first containing the methods of operating on simple numbers and fractions of simple numbers. The second the mode of reducing compound to simple numbers, and of performing calculations with compound numbers. The third the commercial rules; and the fourth the methods of involution and evolution.

31. Rule.—*To read, or express in words, any number expressed in figures.*

Divide the figures in the given number, as in the general example above, into periods and half periods, by any convenient marks; then beginning at the left, the figures are thus read, viz. the first figure of each half period is named by itself, with the word hundreds; but the other two are named together; and at the end of the first half of each period, the word thousands is named; but at the end of the other half, the common name of the whole period is read, except it be the units period, the name of which is not expressed.

32. SIMPLE ARITHMETIC.

Simple Addition is the finding of one simple number equal to several simple numbers taken all together. The number which is equal to several taken together, is called their sum.

Simple Addition.

Simple Addition may be performed by this Rule:

1. Place the several numbers to be added underneath each other, so that the figures of the same name, with respect to units, tens, &c. may be directly under each other.

2. Draw a line under the lowest number; then add up the column of units, and consider how many tens are in the sum, for which you must carry so many ones to the next column, writing down only the excess over and above the tens, below the line straight under the column of units.

3. Add all the columns in the same manner, and the figures will express the sum required.

33. *Proof.*—Cut off the uppermost number, by drawing a line below it. Add all the rest of the numbers together, and set their sum below the sum to be proved. Then add this last found number and the uppermost line together, and the sum will be the same as that found by the first addition, when the work is right.

Examples.

2591	39481
45927	22
621	6185
13248	17293
7931	26817
70318	89798

34. Simple Subtraction.

Simple subtraction is the finding how much one simple number exceeds another, or the taking a less simple number out of a greater. The number to be subtracted is called the subtrahend; and that out of which it is to be taken, is called the minuend: also the number remaining after the one is taken out of the other, is named their difference.

35. Simple subtraction is performed by the following Rule:

1. Place the subtrahend under the minuend according to the directions given in addition, and draw a line below them.

2. Begin at the right, and subtract each under figure from that which stands above it, writing the remainder immediately under them below the line: all the remainders together will express the difference required.

3. But when any under figure exceeds that which is above it, conceive ten to be added to the upper, and subtract the under from the sum; but, in this case, you must add one to the next under figure before you subtract it.

36. *Proof.*—Add the difference and subtrahend together, and the sum will be equal to the minuend when the operation is right.

Example.

Minuend . .	159,327
Subtrahend . .	61,489
	97,838
Proof .	159,327

37. Simple Multiplication.

Simple multiplication is the finding of a simple number, which shall contain any given simple number a certain proposed number of times; and it is, therefore, a compendious method of addition.

38. The two proposed numbers are in general termed the factors of the multiplication; but in particular, that which is to be multiplied, is called the multiplicand; and that by which it is multiplied, the multiplier; the number found from the operation is named the product of the two factors.

39. Before proceeding to any operations in this rule, the following table of products must be committed to memory:

Multiplication Table.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27
4	8	12	16	20	24	28	32	36
5	10	15	20	25	30	35	40	45
6	12	18	24	30	36	42	48	54
7	14	21	28	35	42	49	56	63
8	16	24	32	40	48	56	64	72
9	18	27	36	45	54	63	72	81

40. Simple multiplication is performed by one of the two following Rules:

I. *To multiply by any number in the first line of the foregoing table of products.*

Begin at the right of the multiplicand, and multiply each figure in it by the multiplier, writing down the whole of such products as are less than ten; but for such as are just equal to a certain number of tens, write down 0, and carry 1 for each 10 to the next product; and for such as exceed a number of tens, write down the excess, and carry for the tens as before.

II. *To multiply by a number consisting of several figures.*

Write it below the multiplicand, and find the product for each figure in it as in the first case, not regarding in what order the lines are found, provided the first figure in each stand immediately below its respective multiplier.

Add all the lines of products together in the same order as they stand, and the sum will be the whole product required.

41. *Proof.*—Make the former multiplicand the multiplier, and the multiplier the multiplicand, and proceed as before; and the due product will be the same as before, when the work is right. Otherwise, add together the figures in each factor, casting out all the nines in the sums as often as they amount to nine. Multiply the two remainders together, and the nines cast out of their product will leave the same remainder as the nines cast out of the answer, when the work is right.

Examples.

8576	2375	multiplicand.
7	38	multiplier.
60032	19000	
	7125	
	90,250	product.

Contractions.

I. When there are ciphers at the right of one or both factors, proceed as before, neglecting the ciphers; and to the right of the product place as many ciphers as are in both factors.

Thus, to multiply 134 by 2700, multiply 134 by 27, and to the product 3168, join two ciphers, and we get 361,800, the product required.

II. When the multiplier is the product of two or more numbers in the table, it is often of advantage to multiply continually by those numbers, instead of it.

Thus, to multiply 7964 by 72, or the product of 9 and 8, multiply by 9, and the product 71,676 again by 8: thus we get 573,408, the product required.

Simple Division.

42. Simple division is the finding how often one simple number is contained in another; or the dividing of any given simple number into any proposed number of equal parts.

43. The containing number, or number to be divided, is called the dividend. The contained number, or the number of parts into which the

dividend is to be divided, is called the divisor. The number of times the dividend contains the divisor, or the number which expresses one of the equal parts, is called the quotient, thus:

Dividend.
Divisor 3) 12 (4 Quotient.

44. Division is a compendious subtraction, the quotient being the number of subtractions in the operation.

45. Simple division may be performed by the following Rule:

1. Having written down the divisor and dividend in the form above, consider if the divisor be less than, or equal to, the same number of the left hand figures of the dividend; if so, write the figure expressing the number of times it is contained in the quotient; but if not, take one place more of the dividend figures than are in the divisor, and write the number of times they contain it in the quotient as before.

2. Multiply the divisor by the quotient figure.

3. Subtract the product from the said dividend figures.

4. To the remainder bring down the next figure of the dividend, and write in the quotient the number of times the divisor is contained in this number; multiply the divisor by the last quotient figure, and subtract the product from the last-mentioned number; then proceed as before, till all the dividend figures are used.

46. *Proof.*—Multiply the quotient by the divisor; to the product add the remainder, and the sum will be equal to the dividend when the work is right. EXAMPLE.

372) 58247 (156
372
2104
1860
2447
2232
Remainder 215

47. CONTRACTIONS.

1. Division by a single figure, or by any figure in the first line of the multiplication table, may be expeditiously performed by multiplying and subtracting mentally, and writing down only the quotient below the dividend.

EXAMPLE. 7) 579325
82760$\frac{5}{7}$

48. II. When the divisor has ciphers on the right of it, strike them off, and divide without them; but the same number of figures must be struck off from the right of the dividend, and affixed to the last remainder.

EXAMPLE. 8,00) 5734,21
716$\frac{421}{800}$

49. III. When the divisor is the product of two or more small numbers, it is much easier to divide continually by those numbers, than by the whole divisor at once. If there be any remainders after such divisions, multiply the last remainder by the preceding divisor, and to the product add the preceding remainder to the same divisor: then multiply the sum by the next preceding divisor, and to the product add the next preceding remainder: proceed in the same manner through all the divisors and remainders, and the last sum will be the remainder, the same as if the division had been performed at once. After this operation is begun, it must be continued according to the description, though some of the preceding divisions should happen to have no remainders. So to divide 42,901,685 by 96, whose component parts are 8 and 12; divide the first by 8, and this quotient by the 12, and the remainders are 5 and 6; then 6 times 8 are 48, to which add the 5, and the sum 53 is the whole remainder to the whole divisor 96.

8) 42901685
12) 5362710$\frac{5}{8}$
Quotient 446892$\frac{53}{96}$

50. IV. Any person rather ready in division, may, even in the largest divisions, subtract each figure of the product as he produces it, and write down only the remainders.

EXAMPLE. 833) 3104679 (3727$\frac{88}{833}$
6056
2257
5919
88

VULGAR FRACTIONS.—DEFINITIONS.

51. A fraction, or broken number, is an expression of one or more parts of any number.

52. The number of parts into which the number is supposed to be divided, is called the denominator; and the number of those parts expressed by the fraction is called the numerator. These two numbers are in general named the terms of the fraction.

53. If the number of which the fraction is a part, or parts, be 1, it is called a simple fraction; and is denoted by the numerator written above the denominator, with a small line between them: so, $\frac{1}{3}$ denotes one-third of 1; $\frac{7}{8}$ denotes seven-eighths of 1.

54. But if the number be different from 1, it is called a compound fraction, and is denoted by the word of, and the number subjoined to the numerator and denominator expressed as before. So, $\frac{1}{2}$ of 6, denotes one-half of 6; $\frac{2}{3}$ of 8, denotes two-thirds of 8; and $\frac{3}{4}$ of $\frac{5}{8}$, denotes three-fourths of five-eighths of 1.

55. Simple fractions, whose numerators are less than their denominators, are called proper fractions. And those whose numerators are equal to, or greater than, their denominators, are called improper fractions.

56. The expression formed from an integer and a fraction joined together, is called a mixed number. If both the numerator and denominator of a fraction be multiplied or divided by the same number, the fraction will retain its original value. All computations in fractions are founded on this principle.

57. The following signs, being frequently used to avoid circumlocution, require to be here explained:—

=	signifies	equality,	and denotes that	the sums are equal,	Thus, 4 and 4 = 8
+	signifies	addition,	and denotes that	the numbers are added,	Thus, 8 + 2 = 10
−	signifies	subtraction,	and denotes that	the less N. is deducted,	Thus, 8 − 2 = 6
×	signifies	multiplication,	and denotes that	the sums are multiplied,	Thus, 8 × 2 = 16
÷	signifies	division,	and denotes that	the higher N. is divided,	Thus, 8 ÷ 2 = 4

58. RULE I.—*To abbreviate or reduce fractions to less terms.*

Divide the terms of the given fraction by any number which will divide them without a remainder; the quotients will be the terms of a new fraction equal in value to the former. This may be abbreviated again, and the next again, and so on, till it appear that there is no number greater than 1 that will divide them, in which case the fraction is said to be in its least terms.

59. EXAMPLE.—Let $\frac{42}{72}$ be proposed to be abbreviated. $\frac{42}{72}=\frac{21}{36}=\frac{7}{12}$, by dividing first by 2, and then by 3.

60. If the numerator and denominator, instead of being expressed by single numbers, are expressed by the continual product of several, such numbers as are both in the numerator and the denominator may be left out without changing the value of the fraction:

Thus $\frac{7\times 3\times 8\times 10}{7\times 8\times 11}=\frac{3\times 10}{11}=\frac{30}{11}$.

61. If the fraction must be brought to its least terms at one division, divide its terms by their greatest common measure, which common measure is found by dividing the greater term by the less, and this divisor by the remainder; and so on, always dividing the last divisor by the last remainder till 0 remain; then is the last divisor the greatest common measure required.

62. EXAMPLE.—Reduce $\frac{144}{240}$ to its lowest terms at one division.

144) 240 (1
144
96) 144 (1
96
48) 96 (2
96
0

63. Here, as 48 is the last divisor, it will be the greatest common measure of 144 and 240. 144, divided by 48, is equal to 3; and 240, divided by 48, is equal to 5. The fraction $\frac{144}{240}$ is therefore equal to $\frac{3}{5}$, the answer.

64. RULE II.—*To reduce an improper fraction to its equivalent whole or mixed number.*

Divide the numerator by the denominator, and the quotient will be the integer or mixed number required.

EXAMPLES.

$\frac{12}{3}=4.\quad \frac{37}{11}=3\frac{4}{11}\quad \frac{15}{7}=2\frac{1}{7}$.

65. RULE III.—*To reduce an integer to an equivalent fraction of a given denominator.*

Multiply the integer by the given denominator, and the product will be the numerator required.

66. EXAMPLE.—Reduce 7 to a fraction whose denominator shall be 4.

$$7=\frac{7\times 4}{4}=\frac{28}{4}.$$

67. RULE IV.—*To reduce a mixed number to an equivalent improper fraction.*

Multiply the integer by the denominator of the fraction, to the product add the numerator; then the sum written above the denominator will form the fraction required.

68. EXAMPLE.—Reduce $2\frac{3}{7}$ to a fraction.

$$2\frac{3}{7}=\frac{2\times 7+3}{7}=\frac{14+3}{7}=\frac{17}{7}.$$

69. RULE V.—*To reduce a compound fraction to an equivalent simple one.*

Multiply all the numerators together for the numerator, and all the denominators together for the denominator of the simple fraction required. If part of the compound fraction be an integer or a mixed number, reduce it to a fraction by one of the former cases.

70. EXAMPLE.—Reduce $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of 5 to a simple fraction.

$$\frac{1}{2}\text{ of }\frac{2}{3}\text{ of }\frac{3}{4}\text{ of }\frac{5}{1}=\frac{1\times 2\times 3\times 5}{2\times 3\times 4\times 1}=$$

(by omitting the common terms, 1, 2, and 3) $\frac{5}{4}$.

71. RULE VI.—*To reduce fractions of different denominators to equivalent fractions having a common denominator.*

If the fractions can be conveniently reduced to a common denominator, by multiplying or dividing their terms, proceed by that method. But if not, multiply each numerator continually into all the denominators, except its own, for each new numerator; and multiply all the denominators together for the common denominator. In this and several other operations, when any of the proposed quantities are integers, mixed numbers, or compound fractions, they must be reduced by their proper rules to the form of simple fractions.

72. EXAMPLE.—Reduce $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}$ to a common denominator.

Thus $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}=\frac{12}{24}$, $\frac{16}{24}$ and $\frac{18}{24}$,

or $=\frac{6}{12}$, $\frac{8}{12}$, and $\frac{9}{12}$.

73. ADDITION OF VULGAR FRACTIONS.

Reduce such of the fractions as require it to simple ones; then bring the fractions so prepared to a common denominator, and the sum of the numerators placed over this denominator will be the sum of the fractions required.

EXAMPLE.—Required the sum of $2\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{2}$ of $\frac{3}{4}$.

First $2\frac{1}{3}=\frac{7}{3}$, and $\frac{1}{2}$ of $\frac{3}{4}=$ to $\frac{3}{8}$. Therefore the fractions are $\frac{7}{3}$, $\frac{3}{8}$, and $\frac{1}{4}$.

$7\times 8\times 5=280$
$3\times 3\times 5=45$
$4\times 3\times 8=96$
} numerators.

$3\times 8\times 5=120$ common denominator.

And $\frac{280+45+96}{120}=\frac{421}{120}=3\frac{61}{120}$ the answer.

Subtraction of Vulgar Fractions.

74. Rule.—Reduce the fractions, when necessary, to a common denominator, as in addition, then the difference of the numerators, placed over the common denominator, will give the difference of the fractions required.

Example.—What is the difference between $\frac{3}{4}$ and $\frac{5}{7}$?

$3 \times 7 = 21$
$5 \times 4 = 20$ } numerators.

$4 \times 7 = 28$ denominator.

Therefore $\frac{21 - 20}{28} = \frac{1}{28}$ the answer.

Multiplication of Vulgar Fractions.

75. Prepare the fractions, by reducing such as require it to simple ones, as in the former rules; then multiply the numerators together for a numerator, and the denominators for a denominator, and it will give the product required.

76. *Note.*—When one of the factors is a large mixed number, and the other a whole number, it will be best to multiply the parts of the former separately, observing to carry for units to the whole numbers, when necessary.

77. It may here also be further observed, that in the multiplication of whole numbers, the product will be always greater than either of the factors; but if two proper fractions be multiplied together, the product will be less than either of the factors.

Example.—Required the product of $2\frac{1}{2}$, $\frac{1}{8}$, and $\frac{1}{8}$ of $\frac{5}{9}$.

Here $2\frac{1}{2} = \frac{5}{2}$, and $\frac{1}{8}$ of $\frac{5}{9} = \frac{5}{18}$.

Then $\frac{5}{2} \times \frac{1}{8} \times \frac{5}{18} = \frac{5 \times 1 \times 5}{2 \times 8 \times 18} = \frac{25}{288}$, the answer.

Division of Vulgar Fractions.

78. Reduce the fractions, when necessary, to simple ones, as in the former rules; then invert the divisor, and proceed as in multiplication.

79. Example 1.—What is the quotient of $\frac{5}{9}$ by $\frac{3}{15}$?

$$\frac{5}{9} \div \frac{3}{15} = \frac{5}{9} \times \frac{15}{3} = \frac{5 \times 15}{9 \times 2} = \frac{25}{6} = 4\frac{1}{6},$$ the answer.

2. It is required to divide $\frac{1}{3}$ of 19 by $\frac{2}{3}$ of $\frac{3}{4}$.

Here $\frac{1}{3}$ of $19 = \frac{19}{3}$; and $\frac{2}{3}$ of $\frac{3}{4} = \frac{6}{12} = \frac{1}{2}$.

Then $\frac{19}{3} \times \frac{2}{1} = \frac{38}{3} = 7\frac{2}{3}$ the quotient required.

DECIMAL FRACTIONS.

Definition, Notation, and Numeration of Decimals.

80. A decimal is a fraction, the denomination of which is 1 with a cipher or number of ciphers annexed; being always one or more 10th parts, 100dth parts, 1000dth parts, 10,000dth parts, or the like.

81. The arithmetic of vulgar fractions is tedious, and even intricate to beginners. The difficulty arises chiefly from the variety of denominators; for when numbers are divided into different kinds of parts, they cannot be easily compared. This consideration gave rise to the invention of decimal fractions, where all the units are divided into similar parts, and the divisions and subdivisions are regulated by the same scale which is used in the arithmetic of integers. The first figure of a decimal fraction signifies tenth parts, the second hundredth parts, the third thousandth parts, and so on.

82. Decimals are written down without their denominators, the numerators being so distinguished as to evince what the denominators are; which is done by separating, by a point, so many of the right hand figures from the rest as there are ciphers in the denominator; the figures on the left side of the point being integers, and those on the right decimals. Thus $\frac{13}{10}$ is written 1·3, and named 1 and 3 tenths; and $\frac{25}{100}$ is written ·25, and named 25 hundredths, or hundredth parts. But if there be not a sufficient number of figures in the numerator, ciphers are prefixed to supply the defect. So $\frac{1}{100}$ is written ·01, that is 1 hundredth; and $\frac{15}{1000}$ thus ·015, that is 15 thousandths.

83. The use of ciphers in decimals, as well as integers, is to bring the significant figures to their proper places, on which their value depends. As ciphers when placed on the left hand of an integer, have no signification, but when placed on the right hand increase the value ten times each, so ciphers when placed on the right hand of a decimal, have no signification; but when placed on the left hand diminish the value ten times each.

84. The notation and numeration of decimals will be still more obvious from the following examples:—

4·7	signifies.	Four and seven tenth parts.
·47		Four tenth parts, and seven hundredth parts, or 47 hundredth parts.
·047		Four hundredth parts, and seven thousandth parts, or 47 thousandth parts.
·407		Four tenth parts, and seven thousandth parts, or 407 thousandth parts.
4·07		Four, and seven hundredth parts.
4·007		Four, and seven thousandth parts.

Addition and Subtraction of Decimals.

85. Write the proposed numbers under each other, according to the value of their places, as in whole numbers; in which order the decimal points will stand directly below each other: then add or subtract as in whole numbers, placing a decimal point in the sum or difference, directly below the other points.

Examples.

169·3	
27·48	
213·97	from 321·9
·04	sub. 26·481
Sum 410·79	295·419

Multiplication of Decimals.

86. Write down the factors, and multiply exactly as in integers, placing the decimal point to the product, so as to make just as many decimals in it, as there are in both factors together;

and if there be not as many figures in the product as there ought to be decimals, prefix ciphers to supply the deficiency.

EXAMPLES.

52·3	5·12
2·41	·0098
523	4096
2092	4608
1046	·050176
126043	

CONTRACTIONS.

87. When decimals are to be multiplied by 1, with any number of ciphers, it is done by only removing the decimal point so many places farther to the right hand, as there are ciphers in the multiplier, and subjoining ciphers if necessary.

EXAMPLE.

The product of 51·3 and 1000 is 51300·0.

88. When the product will contain many more decimals than are necessary for the purpose, the work may be contracted thus:—Write the units figure of the multiplier directly under such decimal place of the multiplicand, as the last of the product is intended to be, writing the other figures of the multiplier in an inverted order; then, in multiplying, reject all the figures in the multiplicand which are on the right of the multiplying figures, writing the products down so that their right hand figures fall straight below each other, and carrying to such right hand figures from the product of the two preceding figures in the multiplicand thus, viz. 1 from 5 to 15, 2 from 15 to 25, 3 from 25 to 35, &c. and the sum of the lines will be the product to the number of decimals required, and will be seldom wrong even in the last figure.

EXAMPLE.

27·14986		27·14906	
53014·29		92·41035	
24434874		13	574930
542997		81	44958
108599		2714	986
2715		108599	44
81		542997	4
14		24434874	
2508·9280		2508·9280	650510

DIVISION OF DECIMALS.

89. Divide as in integers: and to know how many decimals must be in the quotient, observe the following rules.

90. RULE I. The first figure of the quotient must possess the same place of decimals or integers, as doth that figure of the dividend which stands over the units place of the first product.

91. RULE II. The decimal places of the divisor and quotient together must be equal in number to those of the dividend. Whence, if the number of decimals in the divisor be taken [illegible]he number in the dividend, the remainder [illegible]e number in the quotient. If, in any case there be a remainder after all the dividend figures are used, the quotient may be continued to any number of decimals by bringing down a cipher continually to the last remainder. And whenever the number of figures in the quotient is less than the required number of decimals, prefix ciphers to supply the defect.

EXAMPLE.

52·3) 73·743 (1·41
523
2144
2092
523
523

CONTRACTIONS.

92. When the number of figures in the divisor is great, the division at large will be very troublesome, but may be contracted thus: Having, by the first general rule, found what place of decimals or integers the first figure of the quotient will possess, consider how many figures of the quotient will serve the present purpose; then take the same number of the left hand figure of the divisor, and as many of the dividend figures as will contain them (less than 10 times); by these find the first figure of the quotient, and for each following figure divide the last remainder by the divisor, wanting one figure to the right more than before, but observing what must be carried to the first product for such omitted figures, as in the second contraction of multiplication; and continue the operation till the divisor is exhausted. When there are not as many figures in the divisor, as are required to be in the quotient, begin the division with all the figures as usual, and continue it till the number of figures in the divisor, and those remaining to be found in the quotient be equal, after which use the contraction.

EXAMPLE.

93. Divide 2508·92806 by 92·41035, so as to have four decimals in the quotient, in which case the quotient will contain six figures.

Common way.

92·4103,5) 2508·928,06 (27·1498
66072106
13848610
46075750
91116100
79467850
5539570

Contracted.

92·4103,5) 2508·928,06 (27·1498
660721
13849
4608
912
80
6

To reduce a vulgar fraction to an equivalent decimal.

94. RULE.—Divide the numerator by the denominator, as in division of decimals, and the quotient will be the decimal required.

EXAMPLES.

$\frac{3}{0} = .375$ $\frac{12}{75} = .16$ $\frac{3}{67} = .04477$

REDUCTION.

95. Reduction is the conversion of numbers from one denomination to another, but still retaining the same value. If the reduction be to a less denomination, it is commonly called reduction DESCENDING; but if to a greater, reduction ASCENDING.

96. RULE.—Consider how many of the less denomination make one of the greater, and by that number multiply the given number if the reduction be descending, but divide if ascending, and the product or quotient will be the value in the other denomination. When there are denominations between the proposed and required ones, it is best to reduce the proposed to the next less or greater denomination, and this to the next less or greater again, and so on, till you have reduced it to the denomination required.—When, in reduction descending, the proposed is a compound number, you must add, or take in, the small numbers in the denomination below the greatest, to the same denominations, as you proceed in the reduction. When, in reduction ascending, you have any remainders after dividing, they will have the same denominations as their respective dividends, and may be placed after the last quotient according to the order of their denominations, the greatest first; the compound number thus formed will be the answer.

97. TABLE OF MONEY.

Farthings.	Pence.	Shillings.	Pound.
4	1		
48	12	1	
960	240	20	1

This and the following tables are to be understood thus: The words at the top are the denominations of all the numbers below them; and all the numbers upon the same line, from right to left, are of equal value: thus in the last line of this table, 960 farthings, 240 pence, 20 shillings, and one pound are all equal to each other.

98. The full weight and value of our gold and silver coin is as below:

GOLD.	VALUE. £.	s.	d.	WEIGHT. dwt.	gr.
A Guinea	1	1	0	5	9½
Half guinea	0	10	6	2	16½
Quarter guinea	0	5	3	1	8¼

SILVER.	VALUE. s.	d.	WEIGHT. dwt.	gr.
A crown	5	0	19	8½
Half-crown	2	6	9	16¼
Shilling	1	0	3	21
Sixpence	0	6	1	22½

The value of gold is nearly £4 an ounce, or 2*d.* a grain; and silver is nearly 5*s.* an ounce. Also the value of any quantity of gold is to that of the same weight of standard silver, in the proportion of 15 and 1-14th to 1, or nearly 15 to 1.

99. OF TROY WEIGHT.

Grains.	Pennyweights.	Ounces.	Pound.
24	1		
480	20	1	
5760	240	12	1

By this weight are weighed jewels, gold, silver, corn, bread, and liquors.

100. OF APOTHECARIES WEIGHT.

Grains.	Scruples.	Drams.	Ounces.	Pound.
20	1			
60	3	1		
480	24	8	1	
5760	288	96	12	1

This weight is so called, because the apothecaries use it in compounding their medicines; but they buy and sell their drugs by avoirdupois weight. Apothecaries is the same as troy weight, having only some different divisions.

101. OF AVOIRDUPOIS WEIGHT.

Drams.	Ounces.	Pounds.	Quarters.	Hundrs.	Ton
16	1				
256	16	1			
7168	448	28	1		
28672	1792	112	4	1	
573440	35840	2240	80	20	1

By this weight are weighed all things of a coarse nature; such as grocery and chandlers' wares, and all metals except gold and silver.

	oz.	dwt.	gr.	
1 lb. Avoirdupois makes	14	11	15½	Troy.
1 oz.	0	18	5½	
1 dr.	0	1	3½	

102. OF LONG MEASURE.

Inches.	Feet.	Yards.	Poles.	Furlongs.	Mile.
12	1				
36	3	1			
198	16½	5½	1		
7920	660	220	40	1	
63360	5280	1760	320	8	1

By the statute passed in June, 1824, for establishing uniformity in weights and measures, it was ordained that the imperial standard yard shall be to a pendulum vibrating seconds at London, in the proportion of 36 to 39·1393. From the yard, the other measures of length are deduced.

4 inch—a hand.
6 feet, or 2 yards—a fathom.
3 miles—a league.
60 nautical or geographical miles—a degree.
69½ statute miles nearly.
360 degrees, or 25,000 miles nearly, are the circumference of the earth.

103. OF CLOTH MEASURE.

Inches.	Nails.	Quarters.	Yard.
2¼	1		
9	4	1	
36	16	4	1

3 qrs. = 1 ell Flemish.
5 — — English.
6 — — French.
4 qrs. 1½ inch Scotch.

104. Of Square or Land Measure.

Square inch.	Square feet.	Square yards.	Square poles.	Roods.	Acre.
144	1				
1296	9	1			
39204	272¼	30¼	1		
1568160	10890	1210	40	1	
6272640	43560	4840	160	4	1

Of Scots Land Measure

Square ells.	Falls.	Roods.	Acre.
36	1		
1440	40	1	
5760	160	4	1

105. Of Wine Measure.

Pints.	Galls.	Tierces.	Hhds.	Pun-cheons.	Pipes or Butts.	Ton.
8	1					
336	42	1				
504	63	1½	1			
672	84	2	1⅓	1		
1008	126	3	2	1½	1	
2016	252	6	4	3	2	1

10 gall.—an anker.
18 gall.—a runlet.
31½ gall.—a barrel.

By this measure, wines, brandies, spirits, perry, cider, mead, vinegar, oil, and honey are measured.

106. Of Ale and Beer Measure.

Pints.	Galls.	Firk.	Kilderk.	Bar.	Hhd.
8	1				
68	8½	1			
136	17	2	1		
272	34	4	2	1	
408	51	6	3	1½	1

107. In London, the ale firkin contains 8 gallons, and the beer firkin 9: the other measures above it being decreased and increased in the same proportion.

Of Dry Measure.

Pints.	Galls.	Pecks.	Bush.	Cmbs.	Quar.	Weys.	Last.
8	1						
16	2	1					
64	8	4	1				
256	32	16	4	1			
512	64	32	8	2	1		
2560	320	150	40	10	5	1	
5120	640	320	80	20	10	2	1

108. By the same act it is likewise decreed that the bushel shall be the standard measure of capacity, both for liquids and dry goods, not measured by heaped measure: and that it shall contain ten pounds avoirdupois weight of distilled water, weighed in air, the barometer being at 30 inches. From this standard all the other denominations in the various trades are deduced as above.

109. The bushel, dry measure, by which coals, culm, lime, fish, fruit, or potatoes are sold shall be a bushel containing eighty pounds weight avoirdupois of water; such bushel to be made round, with a plain even bottom, and to be 19½ inches from the outside to the outside; that such bushel, when used for any of the fore-mentioned articles, shall be duly heaped up in the form of a cone, the outside of the bushel to form the extremity of the base of the cone. That three such bushels shall be a sack, and twelve sacks a chaldron.

110. Scots Dry Measure.

Lippies.	Pecks.	Firlots.	Bolls.	Chaldrons.
4	1			
16	4	1		
64	16	4	1	
1024	256	64	16	1

111. Time.

Minutes.	Hours.	Days.	Weeks.	Month.
60	1			
1440	24	1		
10,080	168	7	1	
40,320	672	28	4	1

The minute is divided into sixty seconds, and the second into sixty thirds, &c.

112. Example I. Of Reduction Descending.

How many minutes is 29 days 12 hours 45 minutes, or a lunar month?

29 ds. 12 hs. 45 ms
24

128
58

708
60

42525.

113. Example II. Of Reduction Ascending.

How many pounds, &c. in 35682 pence?

12) 35682

20) 2973*s.* 6*d.*

£148 13*s.* 6*d.*

114. Reduction of Vulgar Fractions.

1. To reduce a fraction of one denomination to that of another which shall have the same value.

Rule. When the reduction is ascending, multiply the denominator by all the different denominations from that given to the one sought; but if it be from a greater name to a less, multiply the numerator by all the denominations as before, and it will give the fraction required.

115. Example. Reduce ⅝ of a penny to the fraction of a pound.

$\frac{5}{6\times12\times20} = \frac{1}{6\times12\times4} = \frac{1}{288}$ the answer required.

2. To find the value of a fraction in the known parts of the integer.

116. Rule. Multiply the numerator by the parts in the next inferior denomination, and divide the product by the denominator; and if any thing remains multiply it by the next inferior denomination, and divide by the denominator as before; and so on as far as can be done;

then the quotients, placed in order, will be the answer required.

EXAMPLE. What is the value of $\frac{4}{5}$ of a shilling?

5
12
—
7) 60
—
8 — 4
4
—
7) 16
—
2 — 2

Answer. 0s. 8d.$\frac{1}{2}$ $\frac{4}{5}$

117. REDUCTION OF DECIMALS.

To reduce numbers of different denominations to their equivalent decimal values.

118. RULE. Reduce both the given number and the integer, to which it is to be referred, to the same denomination; then divide the former of these by the latter, as in the case of a vulgar fraction, and the quotient will be the equivalent decimal required.

119. Or write the given numbers under each other in order, from the least to the greatest for dividends. Then opposite to each dividend, on the left hand, place such a number for a divisor as will bring it to the next superior denomination, and draw a line between them.

120. This done, begin with the uppermost number, and set down the quotient of each division as decimal parts, on the right hand of the dividend next below it; and proceed in this manner to the last quotient, which will give the answer as before.

EXAMPLE. Reduce 15s. 9d$\frac{3}{4}$ to the decimal of a pound. Here 15s. 9d$\frac{3}{4}$ = 759 farthings, 20s = 960 farthings. Whence $\frac{759}{960}$ = 0,790625 the decimal required; or,

4	3
12	9.75
20	15.8125.

.790625 the answer as before.

To find the value of any given decimal in terms of the integer.

121. RULE. Multiply the given decimal by the number of parts in the next denomination, and point off as many places to the right hand as there are places in the decimal.

122. Then multiply the figures so pointed off by the parts in the next inferior denomination, reserving as many places to the right hand as before; and proceed in this manner through all the denominations to the last, when the several figures standing on the left of the decimal point will be the answer required.

EXAMPLE. Find the value of 37623 of a pound.

'37623
20
———
7'52460
12
———
6'29520
4
———
1'18080 Answer 7s. 6d$\frac{1}{4}$.

123. COMPOUND ADDITION.

Compound addition is the finding the sum of several compound numbers.

RULE 1. Place the numbers of the same denomination under each other according to the directions given in simple addition.

2. Add up the figures in the lowest denomination as in simple addition.

3. Find by reduction how many units of the next higher denomination are contained in the sum.

4. Write the remainder or overplus underneath, and carry the ones or units to the figures in the next denomination, whose sum you must find and proceed with as before; and so on, through all the denominations to the highest, whose sum must be all written down, which, together with the several remainders, will express the total required.

EXAMPLES.

Money.			Troy Weight.		
£.	s.	d.	lb.	oz.	dwt.
13	12	4	17	3	15
17	10	3	2	5	7
6	4	1	18	1	17
3	9	2	23	10	12
40	15	10	61	9	11

COMPOUND SUBTRACTION.

124. Compound subtraction is the finding the difference between two numbers, of which one or both are compound.

RULE 1. Write the less number under the greater, as directed in compound addition.

2. Then, beginning at the least denomination, subtract the under number of each from the upper, writing their respective remainders below them.

3. But if the under number of any of the denominations be greater than the upper, add so many to the upper as make one of the next higher denomination; then take the under from the sum, writing down the remainder as before, and carry or add one to the under number of the next higher denomination before you subtract it.

EXAMPLES.

C.	qr.	lb.	A.	R.	F.	E.
12	3	19	15	2	24	18
4	3	24	12	2	36	7
7	3	23	2	3	28	11

125. COMPOUND MULTIPLICATION.

Compound Multiplication is the finding of a number which shall contain a given compound number any proposed number of times.

126. RULE 1.—Write the multiplier under the lowest denomination of the multiplicand.

2. Multiply the number of the lowest denomination by the multiplier, and find how many units of the next higher denomination are contained in the product, as in compound addition.

3. Write down the excess, and carry the ones to the product of the next higher denomination, with which proceed as before; and in like manner with all the other denominations to the highest.

EXAMPLES.

£.	s.	d.		Miles	fur.	poles.
7	9	$8\frac{1}{4}$		31	3	12
		7				11
52	7	$9\frac{3}{4}$		345	4	12

See more on this subject under PRACTICE.

COMPOUND DIVISION.

127. Compound Division is the dividing compound numbers into any proposed number of equal parts.

128. RULE 1. Place the divisor and dividend as in simple division.

2. Begin at the highest denomination and divide each by the divisor, writing the quotients under their respective dividends.

3. But if there be a remainder after dividing any of the denominations except the least, find how many of the next lower denomination it is equal to, and add to it the small number (if any) which was in this denomination before; then divide the sum.

EXAMPLES.

£.	s.	d.		yds	f.	in.
3)1	8	6	12)150		1	7
	9	6		12	1	$7\frac{7}{12}$

See farther on this subject under PRACTICE.

PROPORTION, OR THE RULE OF THREE.

129. The Rule of Three is that by which a number is found having the same proportion to a given number, which is between two other given numbers. It is called the Rule of Three, because in each of its questions there are given three numbers at least. And from its excellent extensive use, it is often named the Golden Rule.

130. RULES *for stating, or setting down, the three given Numbers.*

1. Write down the number which is of the same kind with the answer or number required.

2. Consider whether the answer ought to be greater or less than this number; then write respectively the greater or less of the two remaining numbers on the right of it for the third, and the other on the left for the first number or term.

3. Multiply the second and third terms together, divide the product by the first, and the quotient will be the answer.

131. OBSERVATIONS. 1. When you can conveniently multiply and divide, as in compound multiplication and division, it is better to do so.

2. If not, reduce the compound terms to the lowest name mentioned in them, and the first and third to the same name, if they be not so already; then the answer will be of the same name with the second term.

3. When there happens to be a remainder after division, reduce it to the name next below the last quotient, and divide by the same divisor, and the quotient will be so many of the said next name; do this as long as there is any remainder, till you have reduced it to the least name, and all the quotients together will be the answer.

4. If the first term, and either the second or third can be divided by any number without remainder, let them be divided, and the quotients used instead of them.

132. There are four other methods of operation besides the above general one, any of which, when possible, performs the work much sooner, viz.

1. Divide the second term by the first, multiply the quotient by the third, and the product will be the answer.

2. Divide the third term by the first, multiply the quotient by the second, and the product will be the answer.

3. Divide the first term by the second, divide the third by the quotient, and the last quotient will be the answer.

4. Divide the first term by the third, divide the second by the quotient, and the last quotient will be the answer.

133. EXAMPLE I. To find the value of 14 oz. 8 dwt. of gold, at £3 19s. 11d. an ounce.

134. EXPLANATION. Having stated the three terms by the general rule, as here annexed, the second term is reduced to pence, and the third to dwts. these being their lowest denominations, as above directed. The first term is also reduced to dwts. that it may agree with the third. The second term is then multiplied by the third, and the product divided by the first, according to the general rule, when the answer comes out 13,809 pence, and twelve remaining over; which remainder being reduced to farthings, and these divided by the same divisor, 20, the quotient is 2 farthings, and 8 remaining. Lastly, the pence are divided by 12 to reduce them to shillings, and these again by 20 for pounds; when the final sum comes out £57 10s. 9d. 2q. for the answer.

oz.	£.	s.	d.		oz.	dwt.
1 :	3	19	11	: :	14	8
20	20				20	
20	79				288	
	12					
	959					
	288					
	7672					
	7672					
	1918					

2,0)27619,2

13809,$\frac{12}{20}$ pence, or

12)13809d $2\frac{8}{20}$ qr.

2,0)115,0s. 9d. $2\frac{8}{20}$q.

Answ. £57 10s. 9d. $2\frac{8}{20}$q.

135. EXAMPLE II. How many men must be employed to finish a piece of work in 15 days, which 5 men can do in 24 days?

d.	m.	d.
15 :	5 : :	24
		5

15)120(8 men. Ans.
120

COMPOUND PROPORTION, OR THE RULE OF FIVE.

136. This rule is so called, because that in it there are five numbers or terms given, to find a sixth. It is often named the *double rule of three*, because its questions are sometimes performed by

two operations of the rule of three. Of the five given numbers three contain a supposition, and the other two a demand; one of the terms of supposition being of the same kind with the number required, and the other two of the same kind as the demanding terms.

137. RULES FOR STATING THE FIVE GIVEN NUMBERS.

1. Write down the term of supposition which is of the same kind with the answer, for the middle term.

2. Take one of the other two terms of supposition, and of the demanding terms, both of a kind; and from the direction given in the RULE OF THREE, consider which places they would possess if a stating were made of them and the middle term only, and place them accordingly; do the same with the other term of supposition and its correspondent demanding one, writing the terms under each other which fall on the right and left of the middle term.

138. METHODS OF OPERATION.

1. *By two operations.* Take the two upper terms and the middle term, in the same order as they stand, for the first stating of the rule of three; then take the fourth number resulting from the first stating for the middle term, and the two under terms in the general stating, in the same order as they stand, for the extreme terms of the second stating; and the fourth term resulting from it will be the answer.

2. *By one operation.* Multiply together the terms of which the one is above the other, on both sides of the middle term; then account the two products and the middle term, as they stand, the three terms of a rule of three stating, and the fourth term thence resulting will be the answer. It is generally best to work by the latter method, viz. by one operation. And after the stating, and before commencing the operation, if one of the two first terms, and either the middle term or one of the two last terms, will exactly divide by one and the same number, let them be divided, and the quotients used instead of them; which will much shorten the work.

EXAMPLE.—If 100 men make 3 miles of road in 27 days, in how many days will 150 men make 5 miles?

men	d.	men
150	: 27 : :	100
miles 3		5 miles
450		500
		27

450)13500(30 days. Ans.

The same question by two operations:

men	d.	men	miles	d.	miles
150	: 27 : :	100	3	: 18 : :	5
100			5		
150)2700(18 days			3)90(30 days. Ans.		

RULES OF PRACTICE.

139. *By rules of practice* are meant certain expeditious methods of casting up accounts: and they consist of the most general contractions of the rule of three when either the first or third term is 1.

140. When any of the terms contain decimals or vulgar fractions, the procedure is exactly similar; the rules for reducing, adding, subtracting, &c. decimals and fractions being observed.

141. RULE I. *To find the price of any integer number of things.*

When the number is not very great, multiply the price of 1, or the integer, by the given number whose price is to be found, as in compound multiplication and the product will be the price required.

142. If the multiplier exceed 12, it is commonly better to multiply successively by its component parts, as in simple multiplication. But if the multiplier cannot be exactly produced by the multiplication of small numbers, find the nearest to it, either greater or less, which can be so produced; then after having multiplied continually by the component parts of this number to or from the last product, add or subtract the product of so many as it is less or greater than the given number.

EXAMPLE.—What is the value of 38 cwt. at £1. 11*s.* 4*d.* per cwt.?

£.	s.	d.		
1	11	4		
		3		
4	14	0		
		12		
56	8	0	value of 36 cwt.	
3	2	8	—— of 2 ——	
Answer £59	10	8	38 cwt.	

143. When the number is very large, as many hundreds or thousands, multiply the price of one continually by ten till it comes to the highest denomination. Then multiply these several products by their respective local digits in the given number, which last products place orderly under each other, and add them together for the answer.

EXAMPLE.—To find the price of 7985, at 7*s.* 10¾*d.*

£.	s.	d.		
0	7	10¾ × 5		
		10		
3	18	11½ × 8		
		10		
39	9	7 × 9		
		10		
394	15	10 × 7		
		7		
2763	10	10		7000
355	6	3		900
31	11	8		80
1	19	5¾		5
Answer £3152	8	2¾		7985

144. RULE II.—*When the price of some certain number is given, to find the price of an integer, or* 1.

Divide the given price by its number, as in compound division, and the quotient will be the price of one as required. When the number or divisor exceeds 12, it is better to divide successively by its component parts, as in simple division. But if the divisor cannot be produced by the multiplication of small numbers, divide by it after the manner of long division.

EXAMPLE.—If 22 cwt. cost £24 4s, what will 1 cwt. cost?

£.	s.	
2)24	4	
11)12	2	price of 11 cwt.
1	2	—— of 1 ——

The rent of 172 acres is £197. 16s, what is the rent of 1 acre?

£.	s.	£.	s.	
172)197	16(1	3	Answer.	
25				
20				
516				
516				

145. RULE III.—*If the given price of* 1 *or the integer be an aliquot part of a penny, shilling, or pound.*

Take the same part of the given quantity (whose price is to be found by dividing it by the number of times which the given price of 1 is contained in a penny, shilling, or pound) for the answer in pence, shillings, or pounds respectively.

EXAMPLE.—23984 at 4*d.* or $\frac{1}{3}$ of 1*s.*

3)23984

20)7994*s.* 8*d.*

£ 399. 14*s.* 8*d.* Answer.

146. RULE IV.—*If the given price be no aliquot part of a penny, shilling, or pound.*

Divide it into several aliquot parts, then work for each by rule III. and their sum will be the answer. Or, it may often be divided so, that the less will be aliquot parts of the greater; then take the same parts of the prices found for the greater.

EXAMPLE.—3274 at 13*s.* 9*d.*

			3274		
at 10*s.*		or $\frac{1}{2}$ *l.* is	1637		
— 3	4*d.*	or $\frac{1}{6}$ *l.* is	545	13	4
—	5 or $\frac{1}{8}$ of 3*s.* 4*d.* is		68	4	2
at 13	9	is £	2250	17	6

147. RULE V.—*If there be pounds in the price.*

Multiply the given quantity by the number of them: *and if there be also some odd money,* find its produce by the former rules, and add them together.

EXAMPLE.—2596 at £3. 5*s.*

	2596
	3
at £3. is	7788
— 5*s.* is	649
	£8437 Answer.

148. RULE VI.—*When there is some odd weight, or measure, in the quantity.*

After having multiplied the price by the number of integers (if there be any), divide the odd quantity into aliquot parts of the integer, or of the price of each other, and add them all together.

EXAMPLE.—3 tons 5 cwt. 2 qr. at £7. 9*s.* 3*d.* per ton.

	£.	s.	d.
	7	9	3
			3
	22	7	9
5 cwt. is $\frac{1}{4}$ of a ton,	1	17	$3\frac{3}{4}$
2 qr. is $\frac{1}{10}$ of 5 cwt.		3	$8\frac{3}{4}$
	£24	8	$9\frac{1}{2}$ Answer.

149. RULE VII.—*If there be a fraction in the given quantity.*

After having worked for the integral part by any of the former rules, find the produce of the fraction by multiplying the price by the numerator, and dividing the product by the denominator; then add them together for the answer.

EXAMPLE.—1735$\frac{3}{8}$ at £1. 5*s.*

£.	s.				
1	5				
	3	4)1735	0	0	
		433	15	0	
8)3	15(- - - - - - - -		9	$4\frac{1}{2}$	
		Answer £	2169	4	$4\frac{1}{2}$

TARE AND TRET.

150. Gross weight of any commodity is its own weight together with that of its package, whether it be cask, chest, or any thing else.

151. Tare is the weight of the package, or an allowance made instead of it. What remains after the tare is taken from the gross may be called tare suttle, if there be more deductions.

152. TRET is an allowance of 4lb. upon every 104lb. of tare suttle, on account of dust or other waste. What remains after tret is deducted may be called tret suttle, if there be any following deduction.

153. CLOFF is an allowance of 2lb. for every 3 cwt. and some say, for every 100lb. of tret suttle, to make the weight hold good, when sold by retail.

154. When all the deductions are made, the last remainder is called neat or net weight. When the tare is at so much per cwt. it will be better to divide it into aliquot parts of it, as in the Rule of Practice. The tret being 4 to 104, or 1 to 26, will be found by taking the 26th part of the tare suttle. In calculating oil and spirits, 7$\frac{1}{2}$ lb. neat are allowed to the gallon.

EXAMPLE.

Gross 17 cwt. 3 qr. 14 lb. tare 12 lb. per cwt. tret 4 to 104, and cloff 2 to 100 or 1 to 50. How much neat?

lb.	cwt.	qr.	lb.	
	17	3	14	gross
8 = 1/14	1	1	3	
4 = 1/2	0	2	15½	
	1	3	18½	tare
26	15	3	23½	tare suttle
	0	2	12¾	tret
50	15	1	10¾	tret suttle
	0	1	6¾	cloff
	15	0	4½	neat

INTEREST.

Definitions.

155. Interest is the premium allowed for the loan of money.

156. The sum lent is called the principal. The sum of the principal and interest is called the amount.

157. Interest is allowed at so much per cent. per annum, which premium per cent. per annum, or interest of £100 for a year, is called the rate of interest.

158. Interest is of two sorts, simple and compound.

Simple Interest.

159. Simple interest is that which is allowed for the principal lent only.

160. Rule I. To find the interest for a year, multiply the principal by the rate, and divide the product by 100.

161. II. To find the interest for several years, multiply the interest of one year by the number of them.

162. III. To find the interest for any parts of a year, as ½, ¾, &c. take the same proportional parts of one year's interest.

163. IV. For any number of days, multiply the interest of a year by them, and divide by 365.

Example.

What is the interest of £225 10*s*. for 6¼ years, at 4½ per cent. per annum?

225·5 principal
4·5 rate

100) 1014·75

10·1475 interest for a year
6

60·8850 interest for six years
2·536875 interest for ¼ year

63·421875
or £63. 8*s*. 5¼*d*. the interest required.

164. The above rules for simple interest serve also to calculate commission, brokage, insurance, the stocks, or any thing else rated at so much per cent.

Compound Interest.

165. Compound interest is that which is allowed, not only for the sum lent, but also for its interest; as it becomes due at the end of each stated time of payment.

166. Rule.—Find the amount of the given principal for the time of the first payment by simple interest; then consider this amount as the principal for the second payment, whose amount calculate in the same manner; and so on through all the payments, still accounting the last amount as the principal of the next payment.

Example.

What will £50 amount to in three years at 5 per cent. per annum, compound interest?

To 50 principal
add 2·5 interest for one year

52·5 principal for second payment
2·625 interest

55·125 principal for third payment
2·75625 interest

57·88125
or £57 17*s*. 7½*d*. amount required.

167. In calculating compound interest for parts of times, some authors, for expedition, calculate for a complete time, and then take a part of the result proportionate to the part of the time; but this is not just, as the compound interest does not increase in the early period exactly in proportion to its increase in the late or complete period. In all such calculations therefore, where it is necessary to calculate compound interest for parts of times, the most expeditious and accurate method is by logarithms; for though it is possible to make such calculations without them, the trouble is immense; whereas, by logarithms it is as easy to perform the calculations with parts of times of payment, as with whole ones.

Discount.

168. Discount or rebate is the difference between a sum of money due at a certain time to come, and its present worth. The present value of any sum or debt, due some time hence, is such a sum as, if put to interest, would in the time and at the rate for which the discount is to be made, amount to the sum or debt then due.

169. Rule.—As the amount of £100 for the given rate and time, is to the given sum or debt, so is £100 or the interest of 100 for the given time to the present worth, or to the discount of the given sum, respectively.

170. The method used among bankers in discounting bills is to find the interest of the sum drawn for from the time the bill is discounted to the time when it becomes due, including the days of grace, which interest they reckon as the discount, thereby making the discount more than it really is. But when goods are bought or sold, and discount is to be made for present payment, at any rate per cent. without regard to time, the interest of the sum as calculated for a year is the discount.

171. Example.—What is the present worth of £700 due 9 months hence, discount at 5 per cent. per annum?

100
3·75 interest for 9 months.

103·75 amount of 100*l*.

£ £ £
103·75 : 700 :: 100
100

103·75) 70000 (674·6988
or £674 13*s*. 11*d*. present worth sought.

Equation of Payments.

172. Equation of payments is the finding a time, when, if a sum of money be paid which is equal to the sum of several others due at different times, no loss will be sustained by either party.

173. Rule.—Multiply each payment by the time at which it is due, then dividing the sum of the products by the sum of the payments, the quotient is the equated time.

174. Example.—A debt of £60 is to be paid £30 at 2 months, and £30 at 4 months: but if it be reduced to one payment, at what time must it be paid?

£
2 × 30= 60
4 × 30=120

60) 180 (3 months, the time required.
180

COMMERCIAL ARITHMETIC.

Introduction.

175. Although every branch of arithmetic might come under the title commercial, as the whole science is more or less applicable to commerce, yet under this head we mean only to comprehend those rules of arithmetic, as they are commonly called, not yet taken notice of, which are generally inserted in practical treatises on this science; but which could not with propriety be introduced in the preceding parts, and which do not properly come under the articles Algebra, Book-keeping, Geometry, or Logarithms.

Single Fellowship.

176. Single fellowship is a rule by which any sum or quantity may be divided into any assigned number of parts, which shall be proportional to so many other proposed numbers, each to each. By this rule are adjusted the gain or loss or charges of merchants in company, the effects of bankrupts, legacies in case of a deficiency of assets, &c.

177. Rule.—Make the sum of the numbers, to which the acquired parts must be proportional, the first term; the quantity to be parted or divided, the second; and each of the given numbers, to which the required ones must be proportional, the several third terms, of so many rule of three questions; the fourth terms of which will be the respective parts required.

178. Example.—Two merchants, A and B, trade together: A puts into the stock £60 and B puts in £40. They gain by trading £24. What are their shares of it?

60
40
—
100 : 24 {
£ *s*.
:: 60 : 14 8 A's share.
:: 40 : 9 12 B's share.

Proof, £. 24

Double Fellowship.

179. When the shares of the partners are continued in company unequal times, they occasion the name fellowship with time, or double fellowship; which is performed by the following

180. Rule.—Multiply each share by the time of its continuance; then divide the gain or loss in proportion to the products, as in single fellowship, by saying, as the sum of the products is to the whole gain or loss, so is each product to each part of it.

181. Example.—A had in company £50 for 4 months, B £60 for 5 months, at the end of which time they gained £24. How must it be divided between them?

4 × 50=200
5 × 60=300
—
600 : 24 {
£ *s*.
:: 200 : 9 12 A's share
:: 300 : 14 8 B's share.

Proof, £ 24

Barter.

182. Barter is the exchanging of commodities; and as neither party is supposed to sustain any loss, when the commodities exchanged are not of equal value, the defect is supplied with money, &c.

183. Case I.—When the quantity of one commodity is given, with its value or that of its integer; as also the value of the integer, or rate of selling some other commodity to be given for it, to find the quantity of this; or, having the quantity of the latter given, to find the rate of selling it. If the amount of the given quantity be unknown, calculate it in the shortest manner you can from the given value of its integer; then find how much of the other quantity this amount will purchase at the given rate of selling it; or, if the quantity be given, from thence find the rate of selling it.

184. II.—If the quantities of both commodities, with the rate of selling them, be given, to find what quantity of some other commodity or money must be given in case of an inequality of the amount of the first commodities. Calculate the amount of each of the two given commodities; then their difference is the money, or amount of the third commodity to be advanced; whose quantity, from thence and its rate, is easily found.

185. III.—When, in bartering, one commodity is rated above the ready money price, to find the quantity and bartering price of the other commodity. As the ready money price of the one is to its bartering price, so is that of

the other to its barter price; then the quantity of the latter commodity may be found either from the ready money or bartering prices.

These are the most general cases in barter, and such questions as are not contained in them, are easily resolved from a little consideration of their nature.

Loss and Gain.

186. Questions in this rule are such whose solutions determine the loss or gain upon commodities; of which questions there is a great variety; but they may be all easily solved from a little consideration and the following proportion, viz. That the gains or losses are in proportion as the quantities of goods, &c.

Exchange.

187. By exchange is meant the bartering or exchanging of the money of one place for that of another, and, like the bartering of wares, it commonly consists in finding what quantity of the money of one place will be equal to a given sum of another, according to a given course of exchange.

188. By course of exchange is meant the variable sum of the money of one place, which is proposed to be given for a constant piece or sum of that of another, to serve for the present as a rate or proportion by which to exchange other sums; and it is sometimes above and sometimes below the par.

189. By the par of exchange is meant an intrinsic equality between two pieces or sums of money, one of which is the constant piece or sum to which the course is compared. The money in the banks of foreign places is finer or purer than that which is current in them; and the difference between any sum, as valued in the one, and its value in the other, is called agio.

190. It is by comparing the bank money with ours, that the par is ascertained. The exchange is always supposed to be made in bank money; and if there be a necessity for taking currency in case of a defect of the bank to answer the bills, the more of it must be received, and that in proportion to the agio.

With Ireland, America, and the West Indies.

191. Accounts are kept in Ireland, America, and the West Indies, in pounds, shillings, and pence, as in England; and the exchange per cent. sterling; the par being £108 6*s*. 8*d*. Irish per 100*l*. sterling, has heretofore been £1 1*s*. 8*d*. per pound; but has recently been reduced to the English standard: 5*l*. sterling is accounted worth £7 of the currency of the West Indies, because of the plenty of foreign coins there.

With Holland, Flanders, and Germany.

192. In these places accounts are kept sometimes in pounds, shillings, and pence, as in England; and sometimes in guilders, stivers, and pfennings. The money of Holland and Flanders is distinguished by the epithet Flemish, and they exchange by the pound sterling, the par being 33*s*. 4*d*. Flemish per pound sterling.

In Holland and Flanders.

16 pfennings make 1 stiver.
20 stivers or 40 pence—1 guilder or florin.
8 pfennings—1 grote or penny.
12 grotes or pence—1 skilling.
20 skillings—1 pound.

In Germany.

12 pfennings—1 shilling lubs.
16 lubbish shillings—1 mark.
6 pfennings—1 grote flem.
6 lubbish shil.—1 skil flem.
7½ marks lubs—1 pound flem.

With France.

193. In France accounts are kept in livres, sols, and deniers; exchange being made by the French crown, the par of which is as 2*s*. 6*d*. sterling, or more accurately, 2*s*. 5¼*d*.

12 deniers—a sol or sou, value	0	0	½
20 sols—a livre	0	9	¾
3 livres—1 crown or ecu .	2	5	¼

With Spain.

194. In Spain they keep their accounts in piastres, rials, and maravedis; reckoning 372 maravedis to a rial, and 8 rials to a piastre, by which they exchange, and its par is 4*s*. 6*d*. sterling.

With Italy.

195. In Genoa and Leghorn they keep their accounts in livres, sols, and deniers, as in France, but exchange by the piastre, as in Spain, which in Genoa is accounted 5 livres, and at Leghorn 6. At Venice too accounts are by some kept in the same manner, and by others in ducats and gross, reckoning 24 gross to a ducat, upon which they exchange, and its par is accounted 4*s*. 4*d*. sterling.

With Portugal.

196. In Portugal accounts are kept in milreas and reas, reckoning 1000 reas to a milrea, as its name imports; and they exchange by the milrea, the par of which is about 6*s*. 8½*d*. or 6*s*. 9*d*. sterling.

General Rules, *showing in what manner computations respecting the comparison of monies are to be made:*

I. Reduce the given sum, if necessary, to that kind of money by which exchange is computed.

II. Reduce this, according to the given rate of exchange, into the corresponding money of the other country.

III. Reduce the exchange of money thus found, if necessary, to the kind of money required.

197. Examples. — I. How much sterling money is in 5476 guilders, current exchange, 36*s*. 3*d*. Flemish per pound sterling, agio 2½ per cent.

102·5 : 100 :: 5776
100 G. Bank.

102·5) 547600 (5342·4
40

£. *s*. *d*.
36*s*. 3*d*.=435*d*.) 2136960 (491 5 6

Here, agreeably to the first of the preceding general rules, we reduce 5476 guilders current to 5342·4 banco, by the proportion of 102½ to 100; this again is brought to pence Flemish by mul-

tiplying by 40, the pence in a guilder; and since 36*s*. 3*d*. or 435*d*. Flemish is worth £1 sterling; therefore divide by 435, and the quotient £491 5*s*. 6*d*. is the sterling money required.

How many current guilders in £100 sterling, ex. 34s. 8d. flem. per £. ster. agio 2 per cent.

£.	*d. flem.*	£.	*s.*	*d.*
1	: 416 ::	100	34	8
	100		12	
			416	

41600 *d*. Flem. Banco.

100 : 102 :: 41600
102

83200
416000

100) 4243200

40) 42432 *d*. current.

1060 guild. 16 stiv. Ans.

ARBITRATION OF EXCHANGES.

198. As the course or rate of exchange between one nation and another is almost continually varying, either by rising or falling, from the variations in the circumstances and balance of trade; so the design of arbitration is to remit or draw upon foreign places in such a manner, as shall turn out the most profitable.

199. Arbitration is generally divided into two parts, simple and compound.

SIMPLE ARBITRATION.

200. In simple arbitration the exchanges among three places only are concerned. The par of arbitration, or arbitrated price, is such a rate of exchange between two places as shall be in proportion with the rates assigned between each of them and a third place. After this par of arbitration is computed, by comparing it with the present course of exchange, a person can judge which way to remit or draw to the most advantage, and determine what the advantage shall be.

201. EXAMPLE. — The exchange between London and Amsterdam being 33*s*. 9*d*. per pound sterling, and the exchange between London and Paris 32*d*. per crown; the par of arbitration between Amsterdam and Paris is required.

Answer.—By reduction £1 ster.=240*d*. ster. and 33*s*. 9*d*. Flem.=404*d*. Flem.

d. ster. *d*. Flem. *d*. ster. *d*. Flem.
Then 240 : 404 :: 32 : 54

The par of arbitration, therefore, between Amsterdam and Paris is 54*d*. per crown.

COMPOUND ARBITRATION.

202. Compound arbitration respects the cases in which the exchanges between three, four, or more places are concerned.

203. A person who knows at what rate he can draw or remit directly, and also has advice of the course of exchange in foreign places, may trace out a path for circulating his money, through more or fewer of such places, and also in such order, as to make a benefit of his skill and credit: and herein lies the great art of such negociations.

204. But to determine in what order, and through how many places to circulate a bill, no general rule can be given, as it depends entirely upon a person's judgment, and a close attention to the results of former cases of the like kind. The following rules, however, may assist in determining, whether a direct or an assigned circular draft be preferable.

205. RULE I.—Distinguish the given rates or prices in the circular course into antecedents and consequents; and place the antecedents in one column, and the consequents in another, on the right, fronting one another, by way of equation. And, in this distribution into antecedents and consequents, each consequent must be of the same kind with the next antecedent, and the first antecedent of the same kind with the last consequent, which must be the sum whose value in exchange is required.

II. Multiply the antecedents continually for a divisor, and the consequents continually for a dividend; and the quotient of the product will be the value of the sum required by such exchange.

Then compute its value by the direct exchange, or by any other circular exchange, and by comparing the values together you will perceive the most advantageous method.

206. EXAMPLE.—If London would remit £1000 sterling to Spain, the direct exchange being 42½*d* per piastre of 272 maravedis; it is required whether will be most profitable the direct remittance, or by remitting first to Holland at 35*s*. per £1; thence to France at 58*d* per crown; thence to Venice at 100 crowns per 60 ducats; and thence to Spain at 360 maravedis per ducat.

ANTECEDENTS.		CONSEQUENTS.
£1 sterling.	=	35*s* or 420*d* Flemish
58*d* Flemish	=	1 crown
100 crowns	=	60 ducats
1 ducat	=	360 maravedis
272 maravedis	=	1 piastre
How many piastres	=	£1000 sterling.

Then $\frac{420\times60\times360\times1000}{58\times100\times272} = \frac{210\times30\times45\times10}{29\times17}$

$= \frac{2835000}{493} = 5750\frac{170}{493}$ piastres = the value of £1000 by the circular exchange.

But 42½*d* : 1 piastre :: £1000 or 240000*d* : $\frac{480000}{85} = \frac{96000}{17} = 5647\frac{1}{17}$ piastres, the value by the direct exchange.

207. Thus it is plain that the circular exchange is the most advantageous, as it produces 103$\frac{170}{493}$ piastres more than the other.

ALLIGATION.

208. Alligation is the method of mixing together several simples of different qualities, so that the composition may be of a middle quality: and it is commonly distinguished into two principal cases, denominated alligation medial, and alligation alternate.

ALLIGATION MEDIAL.

209. Alligation medial is the method of finding the rate of the compound, from having the rates and quantities of the several simples given.

210. RULE.—Multiply each quantity by its rate; then divide the sum of the products, by the sum of the quantities, or the whole composition; and the quotient will be the rate of the compound required.

211. EXAMPLE.—A composition being made of 5lb. of tea at 7*s*. per lb., 9lb. at 8*s*. 6*d*. per lb., and 14lb. at 5*s*. 10*d*. per lb; what is a pound of it worth?

s.	*d.*		£.	*s.*	
7	—	× 5 =	1	15	—
8	6	× 9 =	3	16	6
5	10	× 14 =	4	1	8

28)9 13 2(—6*s*. 10$\frac{1}{2}$*d*. per lb. *Ans*.

ALLIGATION ALTERNATE.

212. Alligation alternate is the method of finding what quantity of each of the simples, whose rates are given, will compose a mixture of a given rate; so that it is the reverse of alligation medial, and may therefore be proved by it.

213. RULE 1.—Write the rates of the simples in a column under each other. 2. Connect, or link with a continued line, the rate of each simple which is less than that of the compound, with one or any number of those which are greater than the compound; and each greater rate with one or any number of the less. 3. Write the difference between the mixture rate and that of each of the simples opposite the rates with which these are linked. 4. Then if only one difference stand against any rate, it will be the quantity belonging to that rate; but if there be several, their sum will be the quantity.

214. It appears from the above rule, that many of the questions of this case will admit of various answers; but from an algebraic process it appears that they will all have infinite varieties of answers; after one or more answers are found by the rule, a great number more are found by increasing or decreasing the quantities in any proportion, or by only increasing or decreasing any one or more single pairs in any proportion, and leaving the other rates as they are; but that answer is commonly desired which gives the rates in the least integer numbers, and those the nearest to each other.

215. EXAMPLE.—How much corn at 2*s*. 6*d*. at 3*s*. 8*d*. at 4*s*. and at 4*s*. 8*d*. per bushel, must be mixed together, that the compound may be worth 3*s*. 10*d*. per bushel?

Rates.				*s.*	*d.*
30	2	10	12 or 2 at	2	6
44	2	10	12 or 2 at	3	8
48 } 46	16	2	18 or 3 at	4	0
56	16	2	18 or 3 at	4	8

216. Sometimes one or more of the ingredients, and sometimes the whole composition is limited to a certain quantity; which may be divided into the three following cases or limitations.

217. LIMITATION I.—When the whole composition is limited to a certain quantity, and that is not found from the method of linking, and taking the differences; augment or diminish the quantity of each ingredient in the same proportion as the given quantity is greater or less than the total quantity found from the linking, by saying, as the total quantity so found is to the given quantity, so is the quantity of each ingredient found by linking to the required quantity of each.

218. II. When one of the ingredients is limited to a certain quantity, and that quantity is not found by the method of linking; either augment or diminish the quantities of all the rest, in the same proportion as the given quantity is greater or less than the quantity of the limited simple found by linking, by stating as in the first limitation; or only augment, or diminish in the above proportion, that part of the quantity of the ingredients with which the limited one is linked, which is the difference of the mixture rate and the rate of the limited simple, and add the resulting quantity of the other parts instead of the said difference, keeping the quantities of the other simples unaltered.

219. III. If more than one of the simples be limited, find, by Case I. what will be the rate of a mixture made of the given quantities of the limited simples only; then consider this as the rate of a limited simple, whose quantity is the sum of the first given limited simple, from which, and the rates of the limited simples, by the second limitation, calculate the quantity of each.

INVOLUTION.

220. A power is a number produced by multiplying any given number continually by itself a certain number of times.

221. Any number is called the first power of itself; if it be multiplied by itself, the product is called the second power, and sometimes the square; if this be multiplied by the first power again, the product is called the third power, and sometimes the cube; and if this be multiplied by the first power again, the product is called the fourth power; and so on.

Thus: 3 is the first power of 3.
3 × 3 = 9 is the second power of 3.
3 × 3 × 3 = 27 is the third power of 3.
3 × 3 × 3 × 3 = 81 is the fourth power of 3.
&c. &c.

222. Involution is the finding of powers; to do which, from their definition there evidently arises this rule. Multiply the given number, or first power, continually by itself, till the number of multiplication be one less than the index of the power to be found, and the last product will be the power required.

EXAMPLE I.—What is the cube of 12·5?
12·5 × 12·5 × 12·5 = 1953·125 Answer.
II. What is the square of $3\frac{2}{5}$ or $\frac{17}{5}$?
$\frac{17}{5} \times \frac{17}{5} = \frac{289}{25} = 11{\cdot}56$. Answer.

EVOLUTION.

223. The root of any given number or power is such a number as being multiplied by itself a certain number of times, will produce the power;

and it is denominated the first, second, third, fourth, &c. root, respectively, as the number of multiplications made of it to produce the given power is 0, 1, 2, 3, &c. that is, the name of the root is taken from the number which exceeds the multiplications by 1, like the name of the power in involution.

224. Evolution is the finding of the roots of numbers, either accurately or in decimals to any proposed extent.

225. The power is first to be prepared for extraction, or evolution, by dividing it from the place of units, the left hand in integers, and to the right in decimal fractions, into periods, containing each as many places of figures as are denominated by the index of the root, if the power contains a complete number of such periods: if it does not, the defect will be either on the right hand or left, or both; if the defect be on the right hand it may be supplied by annexing ciphers, and after this whole periods of ciphers may be annexed to continue the extraction, if necessary; but if there be a defect on the left, such defective period must remain unaltered, and is accounted the first period of the given number, as if it were complete.

226. This division may be conveniently made by writing a point over the place of units, and also over the last figure of every period on both sides of it; that is, over every second figure, if it be the second root, over every third, if it be the third root, &c.

Thus, to point this number 21035896·12735;

. . . . . .

for the second root it will be 21035896·127350;

. . . . . .

and for the third root thus: 21035896·127350.

227. The root will contain just as many places of figures as there are periods or points in the given power, and they will be integers, or decimals respectively, as the periods are so from which they are found, or to which they correspond, that is, there will be as many integer or decimal figures in the root, as there are periods of integers or decimals in the given number.

228. *To extract the square root.*

I. Having pointed the given number into periods of two figures each, find a square number either equal to, or the next less than the first period, which subtract from it, and place the root of the square on the right of the given number, after the manner of a quotient in division, for the first figure of the root required.

II. To the remainder annex the second period for a dividend; and on the left hand of it write the double of the root already found, after the manner of a divisor.

III. Consider what figure, which, if annexed to the divisor, and the result multiplied by it, the product may be equal to, or the next less than the dividend, and it will be the next figure of the root.

IV. From the dividend subtract the product, and to the remainder bring down the next period, for a new dividend; to which, as before, find a divisor by doubling the figures already found in the root; and from these find the next figure of the root, as in the last article; and continuing the operation still in the same manner, till all the periods be used, or as far as you please.

229. When the root is to be extracted to a great number of places, the work may be much abbreviated, thus: having proceeded in the extraction after the common method, till half the required number of figures in the root is found, the rest may be found by dividing the last remainder by its corresponding divisor, annexing a cipher to every individual, as in division of decimals; or rather, without annexing ciphers, by omitting continually the right hand figure of the divisor, after the manner of contractions in division of decimals.

So the operation for the root of 2 to 12 or 13 places may be thus:

2 (1·41421356237 + &c.
1

24	100
4	96
281	400
1	281
2824	11900
4	11296
28282	60400
2	56564
282841	383600
1	282841
2828423	1007,000
3	8485269

2828426) 1590631 (56237 +
176418
6712
1055
206
8

230. By means of the square root also we readily find the 4th root, or the 8th root, or the 16th root, &c. that is, the root of any power whose index is some power of the number 2; namely, by extracting so often the square root as is denoted by that power of 2; that is, two extractions for the fourth root, three for the 8th root, and so on.

231. *To extract the cube root.*

1. Having divided the number into periods of three figures each, find the nearest less cube to the first period; set its root in the quotient, and subtract the said cube from the first period; to the remainder bring down the second period, and call this the resolvend.

2. To three times the square of the root just found, add three times the root itself, setting this one place more to the right than the former, and call this sum the divisor. Then divide the resolvend, wanting the last figure, by the divisor, for the next figure of the root, which annex to the former; calling this last figure e, and the part of the root before found call a.

III. Add together these three products, namely, thrice a square multiplied by e, thrice a multiplied by e square, and e cube, setting each of them one place more to the right than the former, and call the sum the subtrahend; which must not exceed the resolvend; and if it does, then make the last figure e less, and repeat the operation for finding the subtrahend.

IV. From the resolvend take the subtrahend, and to the remainder join the next period of the given number for a new resolvend; to which form a new divisor from the whole root now found; and from thence another figure of the root, as directed in article II, &c.

231. EXAMPLE.—To extract the cube root of 48228·544.

$3 \times 3^2 = 27$	48228·544 (36·4 root.
$3 \times 3 \times 09$	27
Divisor 279	21228 resolvend.
$3 \times 3^3 \times 6 = 162$	
$3 \times 3 \times 6^2 = 324$ } add	
$6^3 = 216$	
$3 \times 36^2 = 3888$	19656 subtrahend
$3 \times 36 = 108$	
38988	1572544 resolvend
$3 \times 36^2 \times 4 = 15552$	
$3 \times 36 \times 4^2 = 1728$ } add	
$4^3 = 64$	
	1572544 subtrahend
	0000000 remainder.

232. *To extract any root whatever.*

Let G be the given power or number, n the index of the power, find by trials a power nearly equal to the given power or number, and having a rational root. Let this assumed power be A, and its root r, and let R be the required root of G.

Then as the sum of $n + 1$ times A and $n - 1$ times G, is to the sum of $n + 1$ times G and $n - 1$ times A, so is the assumed root r to the required root R.

Or, as half the said sum of $n + 1$ times A and $n - 1$ times G is to the difference between the given and assumed powers, so is the assumed root r to the difference between the true and assumed roots; which difference added or subtracted gives the true root nearly.

That is, $\overline{n+1}.A + \overline{n-1}.G : \overline{n+1}.G + \overline{n-1}.A :: r : R$.

Or, $\overline{n+1}.\frac{1}{2}A + \overline{n-1}.\frac{1}{2}G : A \sim G :: r : R \sim r$.

And the operation may be repeated as often as we please, by using always the last found root for the assumed root, and its nth power for the assumed power A.

233. EXAMPLE.—To extract the 5th root of 21035·8. Here it appears that the 5th root is between 7·3 and 7·4. Taking 7·3, its 5th power is 20730·71593. Hence then we have

$G = 21035{\cdot}8 : r = 7{\cdot}3, n = 5, \frac{1}{2}.n+1 = 3, \frac{1}{2}.n-1 = 2.$

$A = 20730{\cdot}716$

$G - A = 305{\cdot}084$

$A = 20730\,716$	$G = 21035{\cdot}8$
3	2
$3A = 62192{\cdot}148$	42071·6
$2G = 42071{\cdot}6$	

As 104263·7 : 305·084 :: 7·3 : ·0213605

73

915252

2135588

104263·7)2227·1132(0213605 the diff.

14184 7·3 = r add

3758	7·321360 = R the root
630	true to the
5	last fig.

234. *General rules for extracting any root of a vulgar fraction or mixed number.*

1. If the given fraction have a finite root of the kind required, it is best to extract the root of the numerator and denominator for the terms of the root required.

2. But if the fraction be not a complete power, it may be thrown into a decimal, and then extracted. Or,

3. Take either of the terms of the given fraction for the corresponding term of the root; and for the other term of the root, extract the required root of the product, arising from the multiplication of such a power of the first assigned term of the root whose index is less by 1 than that of the given power, by the other term of the given number. This rule will do when the root is either finite or infinite.

4. Mixed numbers may be reduced either to improper fractions or decimals, and then extracted.

POSITION.

235. This rule is also called false position or false supposition, because it makes a supposition of false numbers, as if they were the true ones, and by their means, discovers the true numbers sought. The single rule uses only one supposition, but the double rule two; whence their names.

236. To the rule of position belong such questions as cannot be solved by the direct process by any of the former rules; and in which the required number or numbers do not ascend above the first power; such, for example, as most of the questions usually brought to exercise the reduction of simple equations in algebra. But it will not bring out true answers, when the numbers sought ascend above the first power; for then the results are not proportional to their positions, nor the errors to the difference of the true number and each position; yet in all such cases it is a very good approximation, and in exponential equations, as well as many other things, succeeds better than perhaps any other method.

237. Those questions in which the results are proportional to their suppositions, belong to single position; such are those which require the multiplication or division of the number sought by any number, or in which it is to be increased or diminished by itself any number of times, or by any part or parts of it. But those in which the results are not proportional to their positions belong to the double rule; such are those in which the number sought is increased or diminished by some given number, which is no known part of the number required.

238. RULE.—Take any number, and perform the same operations with it, as in the question are described to be performed with the number sought; then, if the result be the same with that in the question, the supposed number is the number sought; but if it be not, say, as the result of the operation is to the position, so is the result in the question to the number required.

239. EXAMPLE.—A person after spending $\frac{1}{3}$ and $\frac{1}{4}$ of his money, has yet remaining £60; what had he at first?

1. Suppose he had at first £120.

		Proof.	
Now $\frac{1}{3}$ of 120 is	40	$\frac{1}{3}$ of 144 is	48
$\frac{1}{4}$ of it is	30	$\frac{1}{4}$ of it is	36
their sum is	70	their sum	84
which taken from	120	taken from	144
leaves	50	leaves	60

as per question.

Then, $50 : 120 :: 60 : \frac{60 \times 120}{50} = \frac{60 \times 12}{5}$

$= 12 \times 12 = 144.$

DOUBLE POSITION.

240. RULE.—Having taken any two convenient numbers for the positions, proceed with each according to the conditions of the question, as if it were the true number sought; and find how much the results are different from the result in the question. Next multiply each of these errors or differences by the other's position; then if the errors be of the same affection, that is, if the results be both either too great or too little, divide the difference of the products by the difference of the errors, and the quotient will be the answer; but if the errors be of different affections, that is, if one result be too great and the other too little, divide the sum of the products by the sum of the errors, and the quotient will be the answer.

241. Or, having found the errors, say, As the sum or difference of the errors, according as they are of a different or the same kind, is to the difference of the suppositions, so is the least error to the correction of the supposition belonging to this error; which must be added to, or subtracted from it, according to the following conditions, viz. If the errors be of the same kind, add, or subtract the correction, to or from this supposition, according as it is greater or less than the other supposition; but if the errors be of different kinds, add or subtract, according as the supposition is the less or the greater of the two; and the sum, or difference, will be the number sought.

242. EXAMPLE.—What number is that, which being multiplied by 6, the product increased by 18, and the sum divided by 9, the quotient will be 20?

First, suppose 30 to be the number sought.

Then $\frac{30 \times 6 + 18}{9} = 10 \times 2 + 2 =$ 22; but it ought to be 20; therefore the error is 2 in excess.

Again, suppose 16 to be the number sought,

Then $\frac{18 \times 6 + 18}{9} = 2 \times 6 + 2 = 12 + 2$ $= 14$; but it ought to be 20; therefore the error is 6 in defect.

And the errors are of different kinds or affections.

Whence, by the first rule, $\frac{30 \times 6 + 18 \times 2}{2 + 6}$ $= \frac{15 \times 3 + 9}{2} - = \frac{54}{2} = 27$, the number sought.

And, by the second rule, $2 + 6 : 30 - 18 :: 2 : \frac{2 \times 12}{8} = 3$, the correction; then $30 - 3 =$ 27, the number sought.

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ARITHMETIC, INSTRUMENTAL, a species of arithmetic, wherein the common rules are performed by means of instruments contrived for expedition; such as several sorts of scales, and sliding rules, &c. particularly those denominated NAPIER'S BONES, which see. The Chinese use instruments in their calculations, and pay little regard to arithmetical rules. See ABACUS, and SWAN-PAN.

ARITHMETIC, TETRACTICAL, is that wherein only the figures 1, 2, 3, and 0, are used. We have a treatise on this arithmetic by Erhard Weigel; but this arithmetic is little better than a curiosity, especially with regard to practice; inasmuch as the numbers may be much more compendiously expressed by decadary arithmetic.

ARITHMETIC, VULGAR, is that conversant about integers and vulgar fractions.

ARIUS, a divine of the fourth century, the head and founder of the Arians, a sect which denied the eternal divinity and substantiality of the Word. He is said likewise to have regarded the Holy Spirit as originally created by the Son. Arius was born in Libya, near Egypt. Eusebius, bishop of Nicomedia, a great favorite with Constantia, sister of the emperor Constantine, and wife of Licinius, became a zealous promoter of Arianism. He took Arius under his protection, and introduced him to Constantia; so that the sect increased, and several bishops embraced it openly. There arose, however, such disputes in the cities, that the emperor assembled the council of Nice, where the doctrine of Arius was condemned, A. D. 325. Arius was banished by the emperor, all his books were ordered to be burnt, and capital punishment was denounced against those who dared to keep them. After five years of exile he was recalled to Constantinople, where he presented the emperor with a confession of his faith that fully satisfied him. Notwithstanding this, Athanasius, bishop of Alexandria, refused to admit him and his followers to communion: and Arius now, in his turn, procured that prelate to be deposed and banished. But the church of Alexandria still refusing to admit Arius, the emperor sent for him to Constantinople; where, upon delivering in a fresh confession of his faith in terms less offensive, the emperor commanded Alexander, the bishop of that church, to receive him the next day into his communion: but that very evening Arius died. The manner of his death was very extraordinary: as his friends were conducting him in triumph to the great church of Constantinople, Arius, pressed by a natural necessity, stepped aside, but expired on the spot, his bowels gushing out; owing, as was suspected, to poison. But his opinions did not die with him; his party continuing still in great credit at court. Athanasius, indeed, was soon recalled from banishment, and as soon removed again; the Arians being countenanced by the government, and making and deposing bishops as it best served their purposes. In short, this sect continued with great lustre above 300 years; it was the reigning religion of Spain for above two centuries; it was on the throne both in the east and west; it prevailed in Italy, France, Pannonia, and Africa; and was not materially checked till about the end of the eighth century. See ARIANS.

ARIZIBO, a town of Porto Rico island, in the West Indies, chiefly inhabited by smugglers.

ARK. Lat. *arca*, a chest or coffer. See the following illustrations.

Arke, a cofer or chest, as our shrines, saue it was flatte, and the sample of ours was taken thereof.
Tindale's Workes, p. 11.

Make the an *arke* of pyne trees, habitaciōs shalt thou make in the *arke*, and shalt pitch it within and without with pitch. *Bible*, 1539. *Genesis*, c. vi.

The great Macedon, that out of Persie chased
Darius, of whose huge power all Asie rong,
In the rich *arke* Dan Homer's rimes he placed,
Who feigned gestes of heathen princes song.
Surrey.

Make thee an *ark* of gopher-wood: rooms shalt thou make in the *ark*, and shalt pitch it within and without.
Genesis.

The one just man alive, by his command,
Shall build a wond'rous *ark*, as thou beheld'st,
To save himself and household, from amidst
A world devote to universal wreck. *Milton.*

This coffer was of shittim wood, covered with plates or leaves of gold, being two cubits and a half in length, a cubit and a half wide, and a cubit and a half high. It had two rings of gold on each side, through which the staves were put for carrying it: upon the top of it was a kind of gold crown, all around it; and two cherubim were fastened to the cover: it contained the two tables of stone, written by the hand of God.
Calmet.

ARK, a vessel to swim upon the water, usually applied to that in which Noah and his family were preserved from the universal deluge. The ark has afforded several points of curious enquiry among the critics and naturalists relative to its form, capacity, materials, &c. The wood of which it was built is called in the Hebrew gopher-wood, and in the Septuagint square timber. Some translate the original cedar, others pine, others box, &c. Pelletier prefers cedar on account of its incorruptibility, and the great plenty of it in Asia; whence Herodotus and Theophrastus relate that the kings of Egypt and Syria built whole fleets of it, instead of deal. The learned Mr. Fuller, in his Miscellanies, has observed, that the wood whereof the ark was built was nothing but that which the Greeks call κυπαρισσος, or the cypress-tree; for, taking away the termination, kupar and gopher differ very little in sound. This observation the great Bochart has confirmed, and shown very plainly that no country abounds so much with this wood as that part of Assyria which lies about Babylon. In what place Noah built and finished his ark is no less a matter of disputation. But the most probable opinion is, that it was built in Chaldea, in the territories of Babylon, where there was so great a quantity of cypress in the groves and gardens in Alexander's time, that the prince built a whole fleet of it for want of other timber. And this conjecture is confirmed by the Chaldean tradition, which makes Xisuthrus (another name for Noah) set sail from that country. The time taken to build the ark is also much disputed, some making it fifty-two years; others, 78, 100, and 120. The Mahommedans say it was constructed in two years.

The dimensions of the ark, as given by Moses, are 300 cubits in length, fifty in breadth, and thirty in height; which some have thought too scanty, considering the number of things it was to contain; and hence an argument has been drawn against the authority of the relation. To solve this difficulty Buteo and Kircher have proved geometrically that, taking the common cubit of a foot and a half, the ark was abundantly sufficient for all the animals supposed to be lodged in it. Snellius computes the ark to have been above half an acre in area. Dr. Arbuthnot computes it to have been 81,062 tons. It contained, besides eight persons of Noah's family, one pair of every species of unclean animals, and seven pair of every species of clean animals, with provisions for them all during the whole year. The former appears, at first view, almost infinite; but if we come to a calculation, the number of species of animals will be found

much less than is generally imagined; out of which, in this case, are excepted such animals as can live in the water; and bishop Wilkins shows that only seventy-two of the quadruped kind needed a place in the ark. By the description Moses gives of the ark, it appears to have been divided into three stories, each ten cubits or fifteen feet high; and it is agreed on as most probable, that the lowest story was for the beasts, the middle for the food, and the upper for the birds, with Noah and his family; each story being subdivided into different apartments, stalls, &c., though Josephus, Philo, and other commentators, add a kind of fourth story under all the rest; being, as it were, the hold of the vessel, to contain the ballast and receive the filth and fæces of so many animals: but F. Calmet thinks that what is here reckoned a story, was no more than what is called the keel of the ships, and served only for a conservatory of fresh water. Drexelius makes 300 apartments; F. Fournier, 333; the anonymous author of the Questions on Genesis, 400; Buteo, Temporarius, Arius Montanus, Hostus, Wilkins, Lamy, and others, suppose as many partitions as there were different sorts of animals. Pelletier makes only seventy-two, viz. thirty-six for the birds, and as many for the beasts. As to the number of animals contained in the ark, Buteo computes that it could not be equal to 500 horses; he even reduces the whole to the dimensions of fifty-six pair of oxen. F. Lamy enlarges it to sixty-four pair of oxen, or 128 oxen; so that, supposing one ox equal to two horses, if the ark had room for 256 horses, there must have been room for all the animals. But the same author demonstrates that one floor of it would suffice for five hundred horses, allowing nine square feet to a horse. As to the food in the second story, it is observed by Buteo from Columella, that thirty or forty pounds of hay ordinarily suffices for an ox a day; and that a solid cubit of hay, as usually pressed down in our hay-racks, weighs about forty pounds; so that a square cubit of hay is more than enough for one ox in one day. Now, it appears, that the second story contained 150,000 solid cubits; which divided between 206 oxen will afford each more hay by two-thirds than he can eat in a year. Bishop Wilkins computes all the carnivorous animals equivalent, as to the bulk of their bodies and their food, to twenty-seven wolves; and all the rest to 280 beeves. For the former he allows 1825 sheep; and for the latter 109,500 cubits of hay; all which will be easily contained in the two first stories, and a deal of room to spare. As to the third story, nobody doubts of its being sufficient for the fowls with Noah, his sons, and daughters. Upon the whole, the learned bishop remarks, that of the two it appears much more difficult to assign a number and bulk of necessary things to answer the capacity of the ark than to find sufficient room for the several species of animals already known to have been there. This he attributes to the imperfection of our list of animals, especially of those of the unknown parts of the earth; adding, that the most expert mathematician at this day could not assign the proportion of a vessel better accommodated to the purpose than is here done, and hence he concludes that the capacity of the ark, which had been made an objection against Scripture, ought to be esteemed a confirmation of its divine authority; since, in those ruder ages men, being less versed in arts and philosophy, were more obnoxious to vulgar prejudices than now; so that had it been a human invention, it would have been contrived according to those notions which form a confused and general view of things, as much too big as it had been represented too little. Besides the places requisite for the beasts and birds and their provisions there was sufficient room, therefore, for Noah's household utensils, instruments of husbandry, and seeds to sow after the deluge; for which purposes he might spare room in the third story for thirty-six cabins, besides a kitchen, a hall, four chambers, and a space about forty-eight cubits in length to walk in.

Ark of the Covenant, a small chest or coffer, three feet nine inches in length, two feet three inches in breadth, and two feet three inches in height, in which were contained the golden pot with manna, Aaron's rod, and the tables of the covenant. This coffer was made of shittim-wood, and covered with a lid of solid gold. The ark was deposited in the holiest place of the tabernacle. It was taken by the Philistines and detained twenty, some say forty years, at Kirjath-jearim; but the people, being afflicted with emerods on account of it, returned it with divers presents. It was afterwards placed in the temple. The lid of the ark was called the propitiatory or mercy-seat; over which were two figures of cherubim placed, with expanded wings of a peculiar form. Here the shechinah rested, both in the tabernacle and temple, in a visible cloud; and hence were issued the divine oracles by an audible voice. The high priest appeared before this mercy-seat once every year on the great day of expiation; and the Jews, wherever they worshipped, turned their faces towards the place where the ark stood. In the second temple there was also an ark, made of the same shape and dimensions with the first, and put in the same place, but without any of its contents and peculiar honors. It was used as a representative of the former on the day of expiation, and a repository of the original copy of the holy Scriptures, collected by Ezra and the men of the great synagogue, after the captivity.

Ark of the Modern Jews, &c. In imitation of the ark of the covenant, the Jews to this day have a kind of ark in their synagogues, wherein their sacred books are deposited. This they call aron. Leo of Modena gives a description of it in his Account of the Customs and Ceremonies of those of his nation: 'The Jews (says he) in the eastern sides of their synagogues have an ark or armoury, called aron, to the memory of the ark of the covenant. In this are preserved the five books of Moses, written on vellum with ink made on purpose.'—A chest, very nearly resembling the Jewish ark, and called the house of the God, was found in Huaheine, one of the islands in the South Sea. Sir Joseph Banks could obtain no other information concerning it than what the name imports.

ARK, in geometry, astronomy, &c. See ARC.

ARKANSAW, a large river of America, rising in the Rocky mountains, in about the latitude of forty degrees north. Its general direction is to the south-east, and it falls into the Mississippi in about the thirty-third degree of north latitude. This river, according to major Pike, is 1981 miles in length from its junction with the Mississippi to the mountains, and from thence to its source 192 miles more, making the total length of its course 2173 miles. It is navigable by boats for 1950 miles when the river is filled with water from the rains; but at other seasons at 1500 miles from its mouth it will be found nearly dry. Major Pike calls this river the 'Paradise of Savages,' from the number of wild animals of all kinds which are continually wandering on its banks. The ground through which the course of this river lies contains vast quantities of salt, with which its waters are so copiously impregnated that they are unfit for drinking. They are also charged with a mixture of reddish earth or mould which is carried along by the rapidity of the stream, and which renders the water extremely unpalatable.

ARKEL (Cornelius Van), an eminent Dutch divine, born at Amsterdam in 1670, and educated under Le Clerc. He was much admired as a preacher among the Arminians; and published Hadriani Junii Homani, Medici animadversa ejusdemque de Coma Commentarius, &c. He died in 1774.

ARKENHOLZ (John), a Swedish author, born at Helsingfors, in 1695. He studied at Upsal, and afterwards made the tour of a great part of Europe. During his stay at Paris he wrote a piece entitled, Considerations sur la France par rappont a la Suede, in which he so severely censured cardinal Fleury, that he complained of him to the court of Sweden. In consequence of this he lost the place of registrar; but in 1743 obtained the office of secretary of public accounts. In 1746 he was keeper of the cabinet of curiosities at Cassel; and some time after was employed in writing the history of Frederick I. which he never completed. He died in 1777. Besides various pieces on political and other subjects, he published the Letters of Grotius to queen Christina, and the Memoirs of that queen.

ARKLOW, a sea-port town of Ireland, in the county of Wicklow, twelve miles south of Wicklow, and thirty-six from Dublin. It had two representatives in parliament. The tide flows very little on its coast. Arklow contains a school for fifty girls, and at the western extremity there are barracks. In May, 1798, this town was attacked and partly destroyed by the insurgents, who were nevertheless dispersed with great loss; and a body of 31,000 of them was afterwards defeated in the vicinity by a small regular force on the 10th of June. In 1795 a discovery was made of native gold in a brook that descends from the north-east side of a mountain about 600 yards above the level of the sea, called Kinshelly, and situate about seven English miles to the west of Arklow. This discovery was made public, and the researches for gold began early in the month of September, and continued till the 18th of October, during which period of about six weeks, the quantity of gold that is supposed to have been collected amounted to 800 ounces. The gold was of a bright yellow color, perfectly malleable; and it was found in pieces of various weights, forms, and sizes, from the most minute particle to 202·7 dwts.; one piece of 2 oz. and another of 22 oz. were also found. Two specimens of this gold were assayed by his majesty's assay-master in the tower of London; one of which appeared to contain in 24 carats, 21⅝ of fine gold, 1⅛ of fine silver, and ⅛ of alloy, which seemed to be copper tinged with a little iron. The works were taken possession of by order of government; and the operations of the peasants, who in great numbers had been industrious in their researches, were discontinued.—*Philosophical Transactions*, vol. lxxxvi. p. 34—45.

ARKWRIGHT (Sir Richard), the celebrated inventor of machinery for spinning and carding cotton. He was originally a barber at Wirksworth, in Derbyshire, and in low circumstances. But about 1767 he changed his line of business, and travelled through the country, buying hair; when coming to Warrington he became acquainted with one John Kay, a clockmaker. To this man he spoke of some mechanical project he had in view; and by him his design was changed, and his attention turned to the spinning of cotton. A machine was projected, and they applied to Peter Atherton, esq. now of Liverpool, who enabled them to construct it. For this machine Mr. Arkwright afterwards took out a patent. He next joined in partnership with a Mr. Smally, of Preston, in Lancashire, but being straitened for money they went to Nottingham. While at Nottingham, he prevailed upon the Messrs. Wrights, bankers, to advance him the sums of money necessary to enable him to go on with his experiments; but as these gentlemen found the amount required larger than they had expected, Mr. Arkwright applied to Mr. Need of Nottingham, who desired him to carry the model of his machine to Mr. Strutt of Derby, his partner in the stocking patent, by whose report he would be guided. Mr. Strutt, a man of great mechanical skill, seeing at a glance the merit of the invention, and how little was required to render it complete, told Mr. Need that he might with great safety close with Mr. Arkwright. In the year 1769, therefore, Mr. Arkwright obtained his patent for spinning with rollers; and Mr. Need and Mr. Strutt became his partners in the concerns to be carried on under it. Mr. Arkwright afterwards erected works at Cromford, in Derbyshire; and acquired a very great fortune. It has been said he enriched himself at other men's expense and ingenuity; but though much attention had been paid to the invention of machines for spinning cotton, before Mr. Arkwright engaged in it, it had been hitherto unsuccessful; and the perfection to which he brought them, overcoming numerous difficulties, shows him to have been a man of great genius, and unwearied perseverance. Upon presenting an address from the high sheriff and hundred of Wirksworth, he was knighted in 1786, as high sheriff of the county of Derby. He died at his works, at Cromford, in Derbyshire, August 3, 1793.

ARLANT, or ARLANCE, a small town of France, situated on the river Dore, the head of a canton in the department of the Puy de Dome. The borough of Arlant, though independent of the magistrates of the town, is commonly reckoned part of it, and they contain together about 3350 inhabitants, many of whom are engaged in working lace. It is fifteen leagues south-east of Clermont-Ferrand.

ARLAUD (James Antony), an eminent painter, born at Geneva in 1668. He went to Paris in pursuit of his business, where he was much patronised by the king; and where he painted his Leda, a copy of which he sold in London for £600. Though he could not be induced to part with the original of this exquisite production, yet, in a fit of enthusiasm, he destroyed it by anatomically cutting it in pieces. He died in 1743.

ARLES, a large, ancient, and well built town of France, in Lower Provence, on the left bank of the Rhone, where the canal of Crapone unites itself with the river, which here divides into two branches. It was founded by the Romans, and was long the station of the prætorian prefect of Gaul. After various changes it became the capital of the kingdom of Arelat in the year 879. It received from its sovereigns several important privileges, and was a flourishing free town from 1218 to 1251, in which year it was brought under the dominion of the count of Provence, with the preservation, however, of most of its rights. In the thirteenth century the house of Anjou acquired the county of Provence by marriage; and, on the extinction of that house in 1481, Arles went with the rest of the county to the French crown. Before the revolution it was the capital of one of the eight districts of Provence, the seat of an archbishop, and of a provincial tax-office. The archbishop had the title of prince of Montdragon, and a revenue of about £1200 sterling. Besides the cathedral church, it has a collegiate church, six parish churches, two abbeys, seventeen religious houses, a Jesuits' college, an hospital, and a royal academy of sciences, founded in 1689. Here have been held, at different periods, no less than thirteen ecclesiastical councils, of which the most important was that in A. D. 314.

The population of Arles is about 21,000. It is the head of a canton, and is nearly 174 miles S. S. E. of Paris. Long. 5° 43′ E., lat. 43° 40′ N. This town is now principally interesting from some very noble monuments of Roman antiquities. Among these the most remarkable is the amphitheatre built by the Romans. It is of an oval form, and about 388 yards in circumference, and the front is thirty-four yards in height. The middle, called the arena, is 142 yards wide, and 104 broad. The porticoes or piazzas are three stories, built with stones of a prodigious size. Each of them consists of sixty arches, which still remain; and the walls are of a surprising thickness, but gone to decay. The obelisk is the only one of this kind to be seen in France. It seems to be one of the forty brought from Egypt to Rome, being of the same oriental granite. They are generally full of hieroglyphic characters; but this is quite smooth. In 1675 it was found in a private garden near the walls of the city, not far from the Rhone It consists of one piece; and is fifty-two feet high, and seven in diameter at the base. It is now supported with four lions made of bronze; and on the top a blue ball is placed, and over that a sun.

ARLEUX, a town of France in the department of the north. It is situated in the ci-devant province of Hainault, six miles south of Douay. It was near this that marshal Villars constructed, in 1711, the lines which he declared should prove a ne plus ultra to the duke of Marlborough; but the duke found means to fix the attention of Villars on a particular point, while he got possession of the lines by a night march.

ARLYNG, in ornithology, a name by which the motacilla œnanthe of Linnæus is called in many parts of England.

ARM,
ARMS,
ARMA'DA,
AR'MAMENT,
AR'MATURE,
AR'MORER,
AR'MORY,
AR'MOUR,
AR'MOURY,
ARM'Y.

Goth. *arms*, Sax. *earm*, Lat. *armus*, the whole joint from the shoulder to the fist. All the words excepting the first are derivatives, signifying in their various modifications accessory means of defence or offence to that naturally possessed.

And, when Abram heard that his brother was taken captive, he *armed* his trained servants, born in his own house, three hundred and eighteen; and pursued them unto Dan. *Genesis.*

His servant *arm'd* against such coverture,
Reported unto all, that he was sure
A noble gentleman of high regard. *Spenser.*

In all the mid-earth seas was left no road,
Wherein the pagan his bold head untwines;
Spread was the huge *armado* wide and broad,
From Venice, Genes, and towns which them confine.
Fairfax.

So by a roaring tempest on the flood,
A whole *armado* of collected sail
Is scatter'd, and disjoin'd from fellowship.
Shakspeare.

The *armorers*, accomplishing the knights,
With busy hammers closing rivets up,
Give dreadful note of preparation. *Id.*

At length, resolved t' assert the wat'ry ball,
He in himself did whole *armados* bring:
Him aged seamen might their master call,
And chuse for general, were he not their king.
Dryden.

Louder, and yet more loud, I hear th' alarms
Of human cries distinct, and clashing *arms.*
Id.

The whole division that to Mars pertains,
All trades of death that deal in steel for gains,
Were there; the butcher, *armorer*, and smith,
Who forges sharpen'd fauchions, or the scythe.
Id.

When *arm'rers* temper in the ford,
The keen edged pole-axe, or the shining sword;
The red hot metal hisses in the lake. *Pope.*

The sword
Of Michael, from the *armory* of God
Was giv'n him tempered so, that neither keen
Nor solid could resist that edge. *Milton.*

Up rose the victor angels, and to *arms*
The matin trumpet sung. *Id.*

The seas, and rocks, and skies rebound,
To *arms*, to *arms*, to *arms!* *Pope.*

The grace of God is *armour* and defence enough against the most violent incursion of the spirits of the works of darkness. *Jeremy Taylor.*

So Mars omnipotent invades the plain,
(The wide destroyer of the race of man),
Terror, his best loved son attends his course
Arm'd with stern boldness and enormous force.
Pope.

And now with shouts the shocking *armies* closed,
To lances lances, shields to shields opposed,
Host against host the shadowy legions drew,
The sounding darts an iron tempest flew;
Victors and vanquished join promiscuous cries,
Triumphant shouts and dying groans arise;
With streaming blood the slippery ground is dyed,
And slaughter'd heroes swell the dreadful tide.
Id. Iliad.

Down sinks the warrior with a thundering sound,
His broken *armour* rings against the ground. *Id.*

Then the progeny that springs
From the forests of our land,
Armed with thunder, clad with wings,
Shall a wider world command. *Cowper.*

Terror is not always the effect of force; and an *armament* is not a victory. *Burke.*

ARM,
ARM'FULL,
ARM'LESS,
ARM'HOLE,
ARM'PIT,
ARM'LET.
} See the preceding definition.

Cursed be the man that trusteth in man, and maketh flesh his *arm*; and whose heart departeth from the Lord. *Jer.* xvii. 5.

O God, thy *arm* was here!
And not to us, but to thy *arm* alone,
Ascribe we all.
Shakspeare. Henry V.

And, when she takes thy hand, and doth seem kind;
Doth search, what rings and *armlets* she can find.
Donne.

Every nymph of the flood her tresses rending,
Throws off her *armlet* of pearl in the main.
Dryden.

Like helpless friends, who view from shore
The lab'ring ship, and hear the tempest roar,
So stood they with their *arms* across. *Id.*

Amidst our *arms* as quiet you shall be,
As Halcyons brooding on a winter sea.
Id. Indian Emperor.

Long *arms* of oak an open bridge supplied,
And deep the waves beneath them bending glide.
Parnell.

Others hold their plate under the left *armpit*, the best situation for keeping it warm. *Swift.*

The trees spread out their *arms* to shade her face;
But she on elbow lean'd. *Sidney.*

Where the tall oak his spreading *arms* entwines,
And with the beech a mutual shade combines. *Gay.*

ARM, in heraldry; the arm is often borne in coat armour, either erect or cubit, i. e. couped at the elbow, or embowed in armour, that is, couped at the shoulder, bent, grasping a military standard, and the like. A dexter arm embowed in armour, encircled by a wreath of laurel, and the hand grasping a stand of military colors, representing the invincible standard of the French taken in Egypt, are part of the arms of the family of Sir Ralph Abercrombie, as in the diagram annexed.

ARM, in anatomy. See ANATOMY, Index.

ARM, in gardening, is sometimes used in respect of cucumbers and melons, in the same sense as branch of other plants.

ARM, in horsemanship, is applied to a horse, when, by pressing down his head, he endeavours to defend himself against the bit, to prevent his being checked by it. The remedy is, to have a wooden ball covered with velvet, or other matter, put on his chaul, which will so press him between the jaw-bones as to prevent his bringing his head so near his breast.

ARM, in magnetism. A loadstone is said to be armed when it is capped, cased, or set in iron or steel, in order to make it take up the greater weight, and also to distinguish readily its poles. See MAGNETISM.

ARM OF AN ANCHOR, the part to which the fluke is set.

To ARM A SHOT, in gunnery, to roll oakham, rope-yarn, or old rags, about the end of the iron bar which passes through the shot.

ARMACALES, ALMARCHUR, or NAARMALCHA, a river of Babylon, called also Fossa Regia, or the Royal Trench, by Polybius; and the Royal River by Ptolemy. It was a cut made by Nebuchadnezzar from the Euphrates, which naturally divides into two channels, one passing through Babylon, the other through Seleucia, and then falls into the Tigris. The factitious channel between these two is the Armacales; which mixes with the Tigris below Seleucia, at Apamea.

ARMACOTTA, a town of Hindostan, in the district of Marawas, in the Southern Carnatic, seventy-five miles south by west of Tanjore. Long. 78° 55′ E., lat. 9° 43′ N.

ARMADA, SPANISH; the armada which attempted to invade England in the time of Queen Elizabeth. This armada, to which the Spaniards, in confidence of success, gave the name of Invincible, consisted of 150 ships, most of which were greatly superior in strength and size to any that had been seen before. It had on board nearly 20,000 soldiers and 8000 sailors, besides 2000 volunteers of the most distinguished families in Spain. It carried 2650 great guns, was victualled for half a year, and contained such a quantity of military stores as only the Spanish monarch, enriched by the treasures of the Indies and America, could supply. The troops on board were to be joined by 34,000 more, which the Duke of Parma had assembled in the neighbourhood of Nieuport and Dunkirk. For transporting these, he had, with incredible labor, provided a great number of flat-bottomed vessels, and had brought sailors to navigate them from the towns in the Baltic. Most of these vessels had been built at Antwerp; and as he durst not venture to bring them by sea to Nieuport, lest they should have been intercepted by the Dutch, he was obliged to send them along the Scheldt to Ghent, from Ghent to Bruges by the canal which joins these towns, and from Bruges to Nieuport by a new canal which he dug on purpose. This laborious undertaking was already finished, and the Duke now waited for the arrival of the Spanish fleet; hoping that, as soon as it should approach, the Dutch and English ships which

cruised upon the coast would retire. When the news reached England, terror and consternation seized the inhabitants. A fleet of not above thirty ships of war, and those very small in comparison, was all that was to oppose it by sea. All the commercial towns of England, however, were required to furnish ships for reinforcing this small navy. The citizens of London, instead of fifteen vessels, which they were commanded to equip, voluntarily fitted out double the number; and the gentry and nobility equipped forty-three ships at their own charge. Lord Howard of Effingham was admiral; and under him served Drake, Hawkins, and Frobisher, all renowned seamen of courage and capacity. The principal fleet was stationed at Plymouth. A smaller squadron, consisting of forty vessels, English and Flemish, was commanded by Lord Seymour, second son of the protector Somerset, and lay off Dunkirk in order to intercept the Duke of Parma. The land forces of England were more numerous than those of the enemy, but inferior in discipline and experience. An army of 20,000 men was disposed in different bodies along the south coast, with orders to retire backwards and waste the country, if they could not prevent the Spaniards from landing; 22,000 foot and 1000 horse, under the command of the Earl of Leicester, were stationed at Tilbury, in order to defend the capital; and the principal army, consisting of 34,000 foot and 2000 horse, commanded by Lord Hunsdon, was reserved for guarding the Queen's person, and appointed to march whithersoever the enemy should appear. These armies, though all the Spanish forces had been able to land, would possibly have been sufficient to have protected the liberties of their country. But as the fate of England, in that event, much depended on the issue of a single battle, all men of reflection entertained the most serious apprehensions of the shock of at least 50,000 veterans, commanded by so consummate a general as the Duke of Parma. The queen alone was undaunted. She issued all her orders with tranquillity, animated her people to a steady resistance, and employed every resource which either her domestic situation or her foreign alliances could afford. She even appeared on horseback in the camp at Tilbury; and riding through the lines, discovered a cheerful and animated countenance, exhorted the soldiers to remember their duty to their country and their religion, and professed her intention, though a woman, to lead them herself into the field against the enemy, and rather perish in battle than survive the ruin and slavery of her people. 'I know,' said she intrepidly, 'I have but the weak and feeble arm of a woman; but I have the heart of a king, and of a king of England too!' The heroic spirit of Elizabeth communicated itself to the army, and every man resolved to die rather than desert his station.

The Spanish armada was ready in the beginning of May; but its sailing was retarded by the deaths of the admiral and vice-admiral. The command of the expedition was then given to the Duke of Medina Sidonia, a man entirely inexperienced in sea affairs. This promotion, in some measure, served to frustrate the design which was also rendered less successful by other accidents. Next day, after leaving the port of Lisbon, the armada met with a violent tempest, which sunk some of the smallest of their shipping, and obliged the fleet to put back into harbour. After some time spent in refitting, they put again to sea. Being descried by Fleming, a Scottish pirate, he immediately informed the English admiral of their approach. Effingham had just time to get out of port, when he saw the Spanish armada coming full sail towards him, disposed in the form of a crescent, and stretching to the distance of seven miles from the extremity of one division to that of the other. The English admiral, considering that the Spaniards would be much superior to him in close fight, by the size of their ships and the number of their troops, he wisely resolved to content himself with harassing them in their voyage, and with watching attentively all the advantages which might be derived from storms, cross winds, and such like fortuitous accidents. He soon discerned a favorable opportunity of attacking the vice-admiral Recaldo. This he did in person; and on that occasion displayed so much dexterity in working his ship, and in loading and firing his guns, as greatly alarmed the Spaniards for Recaldo's fate. From that time they kept much closer to one another; nothwithstanding which, the English on the same day attacked one of the largest galeasses. Other spanish ships came up to her relief; but in their hurry one of the principal galleons, which had a great part of their treasure on board, ran foul of another ship, and had one of her masts broken. In consequence of this misfortune she fell behind, and was taken by Sir Francis Drake; who on the same day took another large ship, which had been accidentally set on fire. Several other rencounters happened, in all of which the English proved victorious, through the great advantage which they derived from the lightness of their ships, and the dexterity of the sailors, as the Spaniards did not sufficiently understand nautical mechanics to avail themselves of the unusual magnitude of their ships. The English sailed round them, approached, and retired, with a velocity that amazed them, and did immense execution with their cannon; for, while every shot of theirs proved effectual, their ships suffered very little damage from the enemy, whose guns being planted too high, generally spent their force in air. The Spaniards, however, still continued to advance till they came opposite to Calais; where the duke de Medina, having ordered them to cast anchor, sent information to the Duke of Parma of his arrival, and intreated him to hasten the embarkation of his forces. Farnese accordingly began to put his troops on board; but, at the same time, informed Medina, that the vessels which he had prepared were proper only for transporting the troops, but were utterly unfit for fighting; and for this reason till the armada were brought still nearer, and the coast cleared of the Dutch ships which had blocked up Nieuport and Dunkirk, he could not stir without exposing his army to certain ruin, the consequence of which would probably be the entire loss of the Netherlands. In compliance with this request, the armada was ordered to advance; and it had arrived within

sight of Dunkirk, between the English fleet on the one hand, and the Dutch on the other, when a sudden calm put a stop to all its motions.

In this becalmed situation the three fleets remained for one whole day. About the middle of the night a breeze sprung up; and Lord Howard had recourse to an expedient which had been happily devised on the day before. Having filled eight ships with pitch, sulphur, and other combustible materials, he set fire to them, and sent them before the wind against the different divisions of the Spanish fleet. When the Spaniards beheld these ships in flames approaching towards them, it brought to their remembrance the havock which had been made by the fire-ships employed against the Duke of Parma's bridge at the siege of Antwerp. The darkness of the night increased the terror with which their imaginations were overwhelmed, and the panic flew from one end of the fleet to the other. Each crew, anxious only for their own preservation, thought of nothing but how to escape the present danger. Some of them took time to weigh their anchors, but others cut their cables, and suffered their ships to drive with blind precipitation, without considering whether they did not thereby expose themselves to a greater danger than that which they were so solicitous to avoid. In this confusion the ships ran foul of one another: the shock was dreadful, and several of them received so much damage as to be rendered unfit for future use. When day-light returned Lord Howard had the satisfaction to perceive that his stratagem had fully produced the desired effect. The enemy were still in extreme disorder, and their ships widely separated and dispersed. His fleet had lately received a great augmentation by the ships fitted out by the nobility and gentry, and by those under Lord Seymour, who had left Justin de Nassau as alone sufficient to guard the coast of Flanders. Being bravely seconded by Sir Francis Drake, and all the other officers, he made haste to improve the advantage which was now presented to him, and attacked the enemy in different quarters at the same time with the utmost impetuosity and ardour. The engagement began at four in the morning, and lasted till six at night. The Spaniards displayed in every rencounter the most intrepid bravery; but, from the causes already mentioned, they did very little execution against the English, while many of their own ships were greatly damaged, and twelve of the largest were either run aground, sunk, or compelled to surrender. It was now evident that the purpose of the armada was utterly frustrated. The Spanish admiral, after many unsuccesful rencounters, prepared therefore to make his way home; but as the winds were contrary to his return through the channel, he resolved to take the circuit of the island. The English fleet followed him for some time; and had not their ammunition fallen short, they would have obliged the armada to surrender at discretion. Such a conclusion of the enterprize would have been truly illustrious to the English, but the event was scarce less fatal to the Spaniards. The armada was attacked by a violent storm in passing the Orkneys; and the ships, having already lost their anchors, [illegible]ged to keep at sea, while the mariners, unaccustomed to hardships, and unable to manage such unwieldy vessels, allowed them to drive on the western isles of Scotland, or on the coast of Ireland, where they were miserably wrecked. Not one half of the fleet returned to Spain, and a still smaller proportion of the soldiers and seamen. Queen Elizabeth ordered medals to be struck on the occasion, with this motto,—Afflavit Deus et dissipantur.

ARMA Dare, to give arms, in some ancient charters, signifies to dub, or make a knight.

Arma Deponere, to lay down arms, was a punishment anciently enjoined when a man had committed an offence.

ARMADILLA, denoted a squadron of men of war, in the Spanish American navy, formerly maintained on the American coast to prevent foreigners from trading with the Spaniards and the Indians, both in time of war and peace. The vessels of this armadilla were commonly called guarda costas.

ARMADILLO, in zoology, a synonyme of the dasypus. See Dasypus.

Armadillo, in entomology, one of the Linnæan species of the oniscus genus. It is oval, cinereous, brown; the tail is obtuse, and entire. Found in Europe.

ARMAGEDDON, a Hebrew name, used in Rev. xvi. 16, which has occasioned much dispute among commentators. Its name alludes to Megiddo, where Barak, with 10,000 dispirited, and almost unarmed men, entirely routed, and almost wholly slew, the mighty host of the Canaanites, and may be interpreted the destruction of troops,

ARMAGH, a county in Ireland, in the province of Ulster, is bounded north by Lough Neagh, west by Tyrone and Monaghan county, south by Louth, and east by Down county. It is twenty English miles in breadth, by thirty-one in length from north to south, consisting mostly of a fine fertile soil. The chain of mountains called the Fews, of which Slieve Gullian, the highest, is visible at forty miles distance, traverses nearly the whole of this country, in a south-east direction, exhibiting in their progress caverns, glens, and rocks, so wild and romantic, as to present many highly sublime and picturesque scenes. Few minerals or mineral waters have been yet discovered; and, except the great Lough Neagh, there are but two small lakes, the Camlough or Carlough, and Lough Clay, which supplies Armagh city with water: the chief rivers are the Blackwater, Ban, Callen, Tall-water, Cushier, Tynan, Tara, Fleury, Fork-hill, and Fane rivers. The petty farmers of this county are all more or less engaged in the linen manufacture, and on an average of eleven years previous to 1802, the quantity of that article which they annually sent to the linen-hall of Dublin amounted in value to £210,000, exclusive of what they sold elsewhere. This shire sends two members to parliament. Its towns, besides the city Armagh, are Forkhill, Ready, Loughgall, Market-hill, Newtown, Hamilton, Lurgan, Portadown, and Richill. The county is divided into five baronies; Armagh, Lower and Upper Fews, Upper and Lower Orier, Turranny, and O'Neiland barony, containing a total population of 141,381 inhabitants. This

county lies between 54° 4′ and 54° 30′ N. lat., and between 6° 5′ and 6° 45′ W. long. Armagh is also the metropolitical see of an archdiocese, and an ecclesiastical province of the same name, whose prelate is styled primate of all Ireland, in contradistinction to the archbishop of Dublin, who is simply called primate of Ireland, as determined by an act of council in 1634.

ARMAGH, a city of Ulster, anciently the metropolis of Ireland, and now the capital of the county of Armagh. It is situated on a hill, surrounded by a highly cultivated and picturesque country, and within less than a quarter of a mile of the river Callen, to whose banks it once extended. It is the seat of the consistorial court of the archbishop of Armagh, whose see extends into five counties, viz. Armagh, Derry, Meath, Tyrone, and Louth, being seventy-five English miles from north to south, and from twelve and a-half to thirty-two in breadth. Armagh was, in the middle centuries, an extensive and populous city, and was celebrated as a place of learning, having at one period, according to the Irish historians, 7000 students at its college. The cathedral, a large gothic building, 190 feet from east to west, and 125 from north to south, which was originally designed for Augustinian canons, was often damaged by fire, and ravaged by the Danes, who took off or annihilated the archives of this ancient place. From the time of the suppression of the abbeys, with which Armagh abounded, it had dwindled into a very insignificant and neglected town, and in this state it remained until Dr. Richard Robinson, afterwards Baron Rokeby, was promoted to the primacy. By the princely munificence of this prelate, the cathedral was repaired, and the town altogether renovated. He built and endowed an observatory, with an excellent astronomical apparatus, a library, and a palace, with a chapel on the glebe adjacent to the city. To his liberality Armagh is also indebted for a parish church, lately built, and for a school where children are to be educated gratuitously, according to the modern improved system. The school is in a flourishing condition, and is endowed with 1530 acres of fine land, which in 1804 produced a gross annual rent of £1144. 10*s*. 5½*d*. A very elegant county court-house, in which the business of the assizes, quarter sessions, &c. is transacted, has been lately built, at the foot of the gentle acclivity on which the observatory stands. In front of this building there are very pleasant public walks, surrounded by trees planted in an elliptic form. On the west side of the city there is a charter-house or eleemosynary poor school of considerable magnitude, founded in 1758. In addition to the churches already mentioned, the places of worship are, a large Presbyterian church, a church for the Seceders, a large Roman Catholic chapel, and a small house erected by the Methodists. The city before the union, sent two members to Parliament; it now only returns one. Armagh has a very large market every Tuesday: the principal commodity sold in it is linen cloth in the brown state, the average weekly sales of this article amount to 4500 pieces, of twenty-five yards each, value £5000. There is also a market every Saturday for grain, and all kinds of provisions. By a census taken in 1817 the number of inhabitants were 7010, of which 2001 are of the Established church, dissenters of various sects 1596, chiefly Presbyterians, and 3413 Roman Catholics. Number of houses 1268. Distant north from Dublin sixty-two miles, S. S. E. from Londonderry forty-eight. Long., according to the most accurate observations, 6° 37′ 30″ W., lat. 54° 21′ 15″ N.

ARMAGNAC, a fertile and populous county of France, in Gascony, now included in the departments of the Gers and Upper Pyrenees. It was divided into Upper and Lower, and was likewise known by the appellations of 'white and black Armagnac.' The soil is fertile, and produces corn, wine, flax, and fruit. Considerable traffic is carried on in these productions, and also in poultry, wool, saltpetre, and brandy. The chief town is Auch, now the capital of the department of the Gers.

ARMA LIBERA, free Arms, Lat.; in ancient law, a sword and a lance given to a servant when he was made free.

ARMAMAXI; from arma, Lat. arms, and *αμαξα*, Gr. a carriage; in antiquity, a kind of Scythian chariots, with two wheels, adorned with crowns, shields, and other spoils, carried in procession after the images of the gods and great men.

ARMA REVERSATA, inverted arms, was a punishment when a man was convicted of felony.

ARMARIUM UNGUENTUM, a sympathetic ointment, by which, in the days of credulity, wounds were believed to be cured, however distant the patient, by only anointing the weapons.

ARMASAO, a small town of Brasil, which is a great fishing station for whales. Several piers project from the shore into eighteen to twenty feet depth of water, on which are erected cranes and other machinery; and hither are the fish which are caught on the coast brought to be cut up and boiled. Long. 47° 20′ W., lat. 27° 5′ S.

ARMATA, in entomology, a species of apis, the melitta armata of Kirby, a native of Europe. Also a species of septura, found in Europe.

ARMATIUM, in ancient physic, a detersive kind of collyrium, of great value in removing asperities of the eye-lids. Its chief ingredients were, æs ustum, gum ammoniac, and the roots of the tree Thus. The preparation is described by Galen, Aetius, Paulus, and Scribonius.

ARMATURA, in the ancient military art, a kind of exercise, performed with missive weapons, as darts, spears, arrows, and the like. Under it were included the throwing of the spear or javelin, shooting with bows and arrows, &c. Used personally, it was an appellation given to the soldiers who were light armed; as well as those in the emperor's retinue.

ARMED KNIGHT, a rock at the Land's End in the county of Cornwall, so called from its resemblance to a man in armour.

ARMED SHIP, a vessel occasionally taken into the service of the government in time of war, and employed to guard some particular coast, or attend on a fleet. She is therefore armed and equipped in all respects like a ship of war, and commanded by an officer of the navy, who has the rank of a master and commander. All ships

of this sort are upon the establishment of the king's sloops, having a lieutenant, master, purser, surgeon, &c.

ARMEGUM, a town of Hindostan, on the shore of the Carnatic, sixty-six miles north of Madras. On the disputes with the Dutch and with the king of Golconda, which ended in the temporary abandonment of Masulipatam, in 1628–9, the British first established themselves in the Carnatic at Armegum, mounting twelve pieces of cannon on the factory. It stands in N. lat. 14°, E. long. 80° 18′.

ARMENA, in botany, a name given by Pliny to a kind of wild asparagus; but the ancient Greeks used the same word to express the young shoots of all esculent plants.

ARMENE, or ARMINA, an ancient village of Paphlagonia. The inhabitants encompassed it with a wall, because of the coldness of the place, imagining they should by that means render it warmer. But this proving ineffectual, gave rise to the proverb, Armenen muro cingere, used to express some egregious folly.

ARMENIA.

ARMENIA, commonly called Hâik, in ancient and modern geography, a country in the north-east part of the Turkish dominions in Asia. Armenia, its most ancient name, is supposed by some to have been derived from Aram, the original denomination of Syria. The Greeks derived it from Armonus, one of the Argonauts who settled in this country. Messrs. Bochart and Bryant, nevertheless, thought differently; the former supposing it to be a contraction of הרמני, Har-mini, the mountain Mini, the name of a province of this country, mentioned by Jeremiah the prophet, ch. li. 27, and placed by him between Ararat and Aschenaz; and probably referred to by Amos (ch. iv. 3) under the name of הרמונה, Harmunah, or mountain of the moon.—Phaleg. l. i. c. 3.; and the latter, Anal. Anc. Mythol. vol. iii. p. 2, distinguishing between this country and Aramea, or the land of Aram, which was separated from it by mount Taurus, supposed it to be denominated from Ar-men or Har-men, the mountain on which the ark rested after the flood.

Armenia was anciently divided into Major and Minor, or the Greater and Lesser. Armenia Major, or Armenia properly so called, was, according to Strabo, bounded on the south by mount Taurus, separating it from Mesopotamia; on the east by the two Medias; on the north by Iberia and Albania, or that part of Caucasus by which both are surrounded; and on the west by Armenia Minor, or the mountains Paryadres, by some Pontic nations, and by the Euphrates. Ptolemy divides the whole of Armenia into three districts: the first, comprehending that part which lies between the Cyrus and the Araxes; the second, those provinces which extend westward to the bending of the Euphrates; and the third, all the country lying between the springs of the Tigris, and that part of the Euphrates which separates Commagene from Armenia Major. The most considerable cities of ancient Armenia were Artaxata, Sebastia, Armosata, Tigranocerta, Artagera, Carcathiocerta, Colonia, and Chorsa. Strabo enumerates six rivers of principal note; viz. the Lycus and Phasis, falling into the Pontus; the Cyrus and Araxes, discharging themselves into the Caspian Sea; and the Tigris and Euphrates, which disembogue themselves into the Persian Gulf. The most considerable mountains were the Moschick, separating the western parts of Armenia from Colchis; the Paryadræ, extending from the former to the borders of Armenia Minor and Pontus; Masius, bounding the province of Sophene to the south, as Antitaurus does to the north; Niphates, Abus, and the Gordyæan mountains.

Armenia Minor was bounded on the east by the Euphrates, which separated it from Armenia Major; on the south by Mount Taurus, parting it from Cilicia; on the west and north by a long chain of mountains, called in different places Mons Scardiscus, Amanus, and Antitaurus, which divided it from Cappadocia. This is a very mountainous country, but some of the mountains are interspersed with pleasant and fruitful vales, abounding with oil and wine, not inferior to the best in Greece. This country was a part of Cappadocia till the reign of Antiochus the Great, when the distinction between Armenia the Greater and the Lesser was introduced; as we have already mentioned. In the time of the Romans it was divided into four provinces; viz. Laviana, Mariana, Aravena, and Melitene, each of which had its cities mentioned by Ptolemy; but those of chief note were Melitene, Nicopolis, Garnace, Aza, Arabyssus, Dascusa, Zimara, and Ladana. The former of these divisions occupied an area of 20,120 miles; the latter from the west of the Euphrates and Armenia Major, extended to Cappadocia and Cilicia, a portion of which it includes. They were also called first and second Armenia, in reference to the different epochs at which it was conquered by the Armenian princes.

The present boundaries of Armenia are Georgia and Mingrelia on the north, the territories of Julamerick and the province of Azerbijan on the south and east, and the river Euphrates on the west. The natural features of this country are delightful in the extreme. The prospect is varied and highly picturesque; beautified by lakes and rivers, and intersected by branches of the Taurian and Caucasian mountains. It is well known to have been the scene in which was laid the terrestrial paradise or garden of Eden, and combines many geographical and political advantages. The climate is cool and agreeable, owing to its great height above the sea, whilst Tournefort observed ice on the stagnant waters near Erzerūm in the month of July. The valleys are warm; and those which are well shaded are replenished with a luxuriance of vege-

vation that exceeds description. Three harvests a-year are common, whilst grapes, melons, pomegranates, figs, peaches, almonds, oranges, and other fruits of rich and delicious flavor, everywhere abound. The northern part is rendered peculiarly pleasing and romantic by several branches of the Caucasus diverging over the country in different directions, answering to the Montes Moschici of the ancients, and the Childir of the Turks. The ancient Taurus is divided into two distinguished chains, the northern and the southern. The latter is a lofty range running down the country as far as Mesopotamia, and was the mount Masius of the Greeks. That part of it lying between the lake Vān and the confines of Media (Azerbijan), was called Niphates among the ancients from its being always covered with snow; and the branch west of the above lake is the Gordyæan range inhabited by the warlike Kurds, who still preserve their ancient name. The northern and southern Taurus are connected by the mount Ararat, on which Noah's ark rested. This celebrated mountain, forming the eastern extremity of that great chain which extends across the northern regions of Asia Minor, has always been remarkable in the history of the world. The top of it is covered with snow. The lower regions are highly diversified with extensive plains and beautiful valleys, while the interior supplies excellent minerals, among which are quarries of pure jasper and marble. The Montes Caspii of the ancients lie on the eastern side of Armenia, towards the Caspian Sea, and divide the country from northern Media. There are also other mountains of less note in different parts of Armenia.

The lakes of Armenia are not numerous. Vān or Argest lying in a valley of the same name, is a deep and extensive basin formed by the different branches of the Taurus. It is the Arcissa Palus of Ptolemy, and the Mantiane mentioned by Strabo. Its length is about eighty miles, and its breadth fifty. Of this lake a modern traveller observes (M. Jaubert, p. 127.), 'The immense extent and tranquillity of its cœrulean waters give it the appearance of a sea which is never ruffled by storms. Its shores are clothed with poplars, tamarisks, myrtles, and oleanders, and many verdant islands inhabited by peaceful anachoretes are scattered over its bosom.' The waters of the lake are extremely salt,and M. Jaubert, p. 139, affirms that they are continually rising in their level. Rivan lies to the east and north-east of Erivan, at a distance of about sixty miles. Its waters are fresh, as its Persian and Armenian names, Kaghir kuni s'ū and Deryāī shīrīn, seem to indicate. This lake is about twenty-five leagues in circumference, and gives rise to the river Zengē. Numerous springs and rivers are found in every part of the country, arising from the hills with which it is intersected. Mineral waters are poured from the foot of the mountains, to which the people resort with their cattle. The Tigris and Euphrates are the two great rivers mentioned by Moses as rising in the garden of Eden, and the Araxes and Rhine (or Phasis) are supposed to be the Gihon and Pison.

The northern part of Asia was not well known to the Greeks, and therefore the accounts which they have left us of its inhabitants are scanty and imperfect. We may, however, learn from them in the general, that the Armenians were a pastoral people, living in a patriarchal manner, in open villages or caverns in the mountains and maintaining themselves chiefly by the produce of their flocks and herds, as their successors the Kurds do at the present day. Xen. Anab. iv. 5. Jaubert, p. 177. They sent wine down the Euphrates to Babylon, Herod. i. 194 and likewise furnished Tyre and the trading towns on the Mediterranean with horses and mules, Ezek. xxvii. 14.

As to the origin of the ancient Armenians, Herodotus, and after him Stephanus, derive them from the Phrygians, on account of several Phrygian words that had been blended with the ancient language of the Armenians. Strabo supposes that they were originally Syrians, or that the Syrians and Armenians were two tribes of the same nation; and in this opinion Bochart acquiesces, as he discovered a great similarity between these two nations in their manners and language. However, in process of time many foreigners settled among them; namely, Phrygians, Greeks, and Persians.

The present inhabitants have the reputation of being quiet, steady, civil, and abstemious to penury; on their journeys a little flour, biscuit, dried fish, and fruit, constitute their only refreshment. In their habits of industry, and also in their disposition to migrate to foreign countries, they are not unlike the Jews, and like them also in keeping themselves for the most part distinct, seldom intermarrying with any other people. Armenia is occupied by several tribes, differing from each other in their characters and dispositions, and governed by independent chiefs. Some of these tribes consist of several thousand individuals, but of the total population of the kingdom no proper estimate can be given.

The wives and children of the Armenians are kept in great subjection to their husbands and parents. The women are kept concealed as much as the wives of the Mussulmans, and seem to have almost as much horror at seeing men. Their husbands, however, are commonly sincere in their attachments, and are generally compelled to make one or two journeys with their relatives before marriage, to try their sincerity. The habit of body amongst the Armenians is large and inclined to coarseness; their features large and distinct, their eyes and complexion dark. Sir Paul Ricaut observes respecting them, that 'the men are naturally of healthy, strong, and robustious bodies, their countenances commonly grave, their features well proportioned, but of a melancholy and saturnine air; but their women, are on the contrary, commonly ill-shaped, long-nosed, and not one of a thousand so much as tolerably handsome.' Armen. Church, p. 386. In Turkey they are distinguished by a black kalpak, or spherical cap of woollen cloth, and generally wear dark colored clothes.

The Armenians were anciently distinguished for their courage and military enterprise, but of late have turned their attention chiefly to trade

and commerce. They form the chief class of traders in the Persian empire: a large portion of Asiatic Turkey is inhabited by them. They are become, in a great measure, masters of the whole trade of the Levant, and are much concerned in that of other places. It is common to meet with Armenians at Leghorn and Venice, and even in England and Holland; whilst they are also known, by their commercial dealings, in Persia, Turkey, and Tartary, and indeed all over the east, and perhaps the world. Schah Abas the Great, it is said, with a view of securing the conquest of Armenia, removed into Persia the first Armenians who ever settled there; and on this occasion about 30,000 families were transported into the province of Ghilan only, whence we have brought the finest Persian silks. He also caused all the inhabitants of Zulfa, a large city of Armenia, to settle at Ispahan, whence the new Zulfa of Persia took its name. This Zulfa is since become the centre of the commerce of the Armenians, of which silk has been considered as the staple commodity; cotton, hemp, and raw silk, are produced plentifully in Armenia; and manna honey and wax in sufficient quantities for exportation.

The idolatry of the ancient Armenians resembled that of the Persians. In the third century S. Savorich or Gregory, by means of his preaching and miracles, converted Tiridates, king of Armenia, to the profession of christianity. In the following century Mesrob, whose disciple Moses of Chorene has left a valuable history of his native country, caused the Scriptures to be translated from the Greek; but this translation has unhappily been interpolated from the Syriac and Vulgate versions.

The Armenians are generally considered as Monophysites, or those who confound the two natures in Christ; but Sir Paul Ricaut thinks that the expression used in their confession of faith is not stronger or more objectionable than that of the Greeks, who certainly do not fall into the heresy of Eutyches. Ric. ubi supra, p. 410. In ecclesiastical decorations and ceremonies their churches bear much resemblance to those of Greece and Rome. They delight in pictures of saints and martyrs, and use crucifixes, but do not pay that sort of external adoration to them that the Greeks and Roman Catholics do. They administer the cup to the laity, and even to children of two or three months old; the wine unmixed is used to show the single nature of Christ. But it may be doubted whether this explanation is not a gloss put by the Roman Catholics upon the ancient usages of the primitive church, preserved by the Armenians. They do not admit the doctrine of an infallible head of the church, nor acknowledge the authority of more than the three first councils. They baptise by trine immersion, and the priests anoint the child's forehead, stomach, armpits, hands and feet, making the sign of the cross on each part. Whether they hold the doctrine of transubstantiation is dubious. They believe in an intermediate state, but not in purgatory; and they pay the same superstitious regard to the pictures of the saints as the other Christians of the east. They keep many and rigid fasts, and some festivals. Christmas they celebrate on the 6th of January. Their church government is episcopal, and their clergy are subject to the patriarch, who resides at the great monastery of Echmiyadzin, about ten miles distant from Erivān. That place is also called Uch kilīsèh, and may be considered as the head quarters of the religion and literature of Armenia.

The Armenian language is harsh and rough, and full of foreign words and idioms. It is not more intelligible to the unlearned, than the ancient Greek is to the present natives of Greece. It has the peculiarity of substituting *gh* for *l*, and converting Paulus into Bōghōs. It abounds in inflections, and in the number of its cases is exceeded by no language but that of the Laplanders. The modification of the sense in verbs, and the order of the words in a sentence, seem to have been influenced by a desire to copy Greek models. The language was brought to its greatest degree of perfection by Mesrob and his disciples in the fourth and fifth centuries, and in the writings of the learned is still preserved unaltered. The best work upon it is Schrœder's Thesaurus Linguæ Armeniacæ, Amsterdam, 1711, 4to.; and one of the most modern, Bellaud's Essai sur la langue Armenienne, Paris, 1812.

Literature has never made any considerable progress in this country, owing to the extreme oppression under which the people have labored. Almost the only book in use among them, except the Scriptures, of which Sir P. Ricaut seems to have heard, was a collection of lives of the saints; and yet the historical and geographical works of Moses of Chorene must have been in the hands of the more learned, and the history of Arekel was actually printed ten years before his book appeared. Since the art of printing was discovered the Armenians have been in this respect gradually improving, and besides the books printed at Rome, Amsterdam, Paris, and Marseilles, have long had presses in constant employment at Echmiyadzin, Constantinople, and Venice. The Armenian convent on the island of St. Lazarus, near the latter place, has a printing-office, which was established in the beginning of the last century, from which, besides commentaries and controversial writings, there have issued grammars, dictionaries, mathematical, philosophical, geographical, and historical works; most of them, however, are modern compilations. The best account of Armenian literature is to be found in Cirbied and Martin's Recherches curieuses sur l' Histoire Ancienne de l'Asie, Paris, 1806, and Martin's Mémoires Historiques et Géographiques sur l'Arménie, Paris, 1818. No less than thirty historical writers are enumerated in these works, and if half that number could be at all compared with the faithful and intelligent Moses of Chorene, it would be fully sufficient to remove the stigma which has been affixed upon the Armenians considered as an illiterate people. There is likewise another circumstance which gives a considerable degree of interest to the learning of the Armenians; and that is, their having translations of Greek writers, of whose works the original is lost. Such, for example, is the Chronicle of Eusebius, of which

a Latin translation by Zohrab and Mai was published at Milan in 1818, and the Armenian original, with another Latin version by Dr. Aucher of Angorn, at the convent in the island of St. Lazarus, in the same year. The complete works of Philo Judæus are also extant in an Armenian version, and would be published by the members of the convent in St. Lazarus, if sufficient encouragement were held out to such an undertaking.

Armenia was, at a very early period, advanced to the honor of a kingdom. After the death of Barzanes, the successor of its first king Scytha, it was divided into petty kingdoms Pliny H. N. l. vi. c. 9. The Armenians were afterwards subdued by the Medes, to whom they were made tributaries by Astyages. During its subjection to the Persians, it was reduced to the form of a province, and its rulers were prefects appointed by the Persian kings. During the minority of Antiochus, Artaxias and Zadriades, two governors of Armenia, united their forces, seized on the country they governed, and, having added to it some neighbouring provinces, erected two kingdoms, viz. that of Armenia Major, which Artaxias reserved for himself, and that of Armenia Minor, which was allotted to Zadriades. Antiochus made several attempts to recover the provinces which these governors had appropriated to themselves, but his efforts were unsuccessful; and, by an alliance with the Romans, they secured to themselves and their posterity the continued possession of them. After the death of Artaxias the Armenian history is interrupted by a chasm of about seventy years; it is only known that the Armenians had engaged in a war with the Parthians, which terminated to their disadvantage. Little else is related of particular interest till the time of Marc Antony, who put to death the reigning sovereign, and conferred the kingdom on Alexander, his son by Cleopatra. According to some writers, Marc Antony sent Artavasdes to Rome in golden fetters. The kingdom was reduced by Trajan to the form of a province, and the Tigris was made the eastern boundary of the empire, which Augustus had thought fit to extend no farther than the banks of the Euphrates; but it soon recovered its liberty, and was again governed by its own kings, in the reign of Constantine the Great and his successor, to whom the kings of Armenia were feudatories. In the Persian war, A. D. 365—378, the tributary kingdoms of Armenia and Iberia, the sovereignty and alliance of which had been solemnly renounced by the Romans, were exposed, without protection, to the arms of the Persian monarch. Armenia was reduced to the state of a Persian province by Sapor, and the administration was shared between a distinguished satrap and a favorite eunuch. In the reign of Justin II. it was subdued by the Saracens, A. D. 687, who held it till the irruption of the Turks; and when they took possession of it, about 755 or 884, they gave it the name of Turcomania. The Turks, by invading Persia and other eastern countries, gave the Armenians an opportunity of throwing off the Turkish yoke, and of choosing kings for themselves; by whom they were governed till the country was again subdued by Occadan or Heccata, the son of Cingis, and first cham of the Tartars. The conquest of the Tartars, however, was not so complete as wholly to extirpate from Armenia the race of its own kings; as we read of some of them who reigned afterwards, and particularly in our own chronicles of Leo king of Armenia, who, in the reign of Richard II., came into England to solicit aid against the Turks, by whom he had been driven from his kingdom. In the year 1472 Uffan Cassanes, king of Armenia, succeeding to the crown of Persia, made Armenia a province of that empire; and in this state it continued till the year 1522, when it was subdued by Selim II. and made a province of the Turkish empire; from which time it has ever continued subject to the Turks, except the eastern part of it, which belongs to the Persians, and some districts in the south which are ruled by independent chiefs. The Turkish pachalics, or governments, are six: Erzerum, Diarbekir, Akiska or Agalzighe, Kars, Bayazid, and Moosh, of unequal extent and importance, and they are divided into subordinate districts. Armenia still contains several large towns, as Erzerum, Diarbekir, Erivan, and many of inferior note; though they are still considerable, such as Akiska, Van, or Artemita, Bayazid, Argish, and Betlis. The population of Erzerum, which is considered the capital, exceeds 100,000.

Armenia is distinguished on medals by the bow, the arrows, and the tiara or hat, as in the subjoined figures, inscription ARMENIA CAPTA.

Fig. 1.

Fig. 2.

ARMENIAN Stone, a mineral stone, or earth, of a blue color, spotted with green, black and yellow; anciently brought only from Armenia, but now found in Germany and the Tyrol. It bears a near resemblance to lapis lazuli, from which it seems only to differ in degree of maturity; it being softer, and speckled with green instead of gold. *Chambers.* See Armenus Lapis.

ARMENIANS, in ecclesiastical history, a division among the eastern Christians, thus called from Armenia the country anciently inhabited by them.

Some have supposed, that Christianity was established in Armenia by the apostle St. Bartholomew; but this is certain, that in the beginning of the fourth century the Armenian Christians were in a flourishing state. In this

century Tiridates the king established an hierarchy; and in the beginning of the sixth, under the patriarch Nierses, the Armenian church seceded from other establishments, became independent, and embraced the theory of the Jacobites, some few articles of discipline excepted. The schism of the Armenians is placed eighty-four years after the council of Chalcedon, A. D. 535. It was consummated at the end of seventeen years; and it is from the year of Christ 552, that the era of the Armenians is dated.

In the fifth century Armenia was divided into fifteen provinces, and subdivided into 191 dioceses. In the sixteenth century the church was under three patriarchs, having archbishops and bishops under them. Other spiritual leaders are called by the name of patriarchs without the authority. The supreme head of the Armenian church is the great patriarch of Echmiazin, who authorises these nominal patriarchs to consecrate bishops, and to make every third year, and distribute among their congregations, the holy chrism or ointment, which, according to a constant custom among the eastern christians, is the exclusive privilege of the patriarchs.

The Armenians, though they agree with the other Monophysites in the main doctrine of that sect, relating to the unity of the divine and human nature in Christ, differ from them, nevertheless, in many points of faith, discipline, and worship; and hence it comes to pass, that they hold no communion with that branch of the Monophysites who are Jacobites in the more limited sense of that term. As to the Eucharist, they agree with the Greeks, except in this, that they mix no water with their wine, and use unleavened bread after the manner of the Latins. Infants of two or three months old are admitted to the communion; and the consecrated bread, soaked in the consecrated wine, is distributed with peculiar ceremonies. See ARMENIA. When the priest takes the chalice and pattin, he is followed by his deacons and sub-deacons with flambeaux and plates of copper furnished with bells: thus accoutred, with a censer before him, he goes in procession round the sanctuary; he then places them on the altar, pronounces the words of consecration, and turns himself to the people, who fall down, kiss the earth, and beat their breasts; then, after taking the bread himself, he distributes it to the people. In the baptism of children they practise trine immersion; and then the priest binds a small cord of silk and cotton round the neck of the child, anoints his forehead, stomach, arm-pits, hands, and feet, and makes on each part the sign of the cross. The child, after baptism, is carried home by the godfather with the sound of drums and trumpets. The women do not go to church for forty days after delivery; and they observe many Jewish customs. The Armenians celebrate an annual festival called Cachacouran, which, half Armenian and half Persian, signifies the baptism of the cross. It is generally supposed that this is a religious ceremony, like the theophany of the Greeks, and the epiphany of the Roman Catholics. It is celebrated on the sixth of January, and the terms signify 'manifestation;' but it is not agreed, whether it commemorates the birth of Christ in his manifestation in the flesh, or his appearance to the wise men when he was manifested to the Gentiles, or his manifestation to the Jews by the voice from heaven at his baptism. Perhaps it is merely a civil institute, resembling the Roman lustrum. The Persians mark this Armenian festival in their almanacs; their Mahommedan kings attend it; and some say it is an imitation of the Abhirkan of the Guebres, or Gaurs, i. e. the festival of lustral water, in use among the ancient Persians.

The Armenians abstain very rigorously from eating of blood, and meats strangled, and are much addicted to fasting; insomuch that from their discourse, one would conclude that almost their whole religion consisted in fasting; the higher the rank of their clergy, so much the greater must be their abstinence. Their monks, every Wednesday and Friday, eat neither fish, nor eggs, nor oil, nor any thing made of milk; and during Lent they live upon nothing but roots; they are allowed wine only on the Saturday in the holy week, and meat on Easter Sunday. Besides the great Lent they have four or five others of eight days each, preparatory for the four great festivals of the Nativity, the Ascension, the Annunciation, and of St. George, during which they are not allowed so much as to speak of eggs, flesh, oil, or butter.

Their monastic order is in great repute among them, since one of their patriarchs introduced that of St. Basil; but part of them, which have united with the church of Rome, have changed their ancient rule for that of the Dominicans.

ARMENIENSTADT, a regular well-built town of Transylvania, in the county of Solnok. The emperor Charles VI. gave the Armenians permission to reside here in 1726. It is inhabited by about 400 families, who trade in cattle and various stuffs. The council-house and the church are handsome buildings, and the town is protected by a strong castle.

ARMENTIERES, a small but elegant town of France, in the department of the North. It was taken by Louis XIV. in 1667. It is seated on the river Lys, 8 miles N.W. of Lisle.

ARMENUS LAPIS, Armenian stone, in natural history, a mineral substance, improperly called a stone; being no other than an ocherous earth, and properly called blue ochre. It is a very valuable substance in painting, being a bright and lively blue. It was so highly esteemed among the ancients, that counterfeits were very commonly attempted. Theophrastus has recorded it as a thing judged worthy a place in the Egyptian annals, which of their kings had the honor of inventing the factitious kind; and he tells us the genuine native substance was a thing of that value, that presents were made of it to great persons, and that the Phœnicians were accustomed to pay their tribute in it.—It is a very beautiful earth, of an even and regular texture; and of a fine blue, sometimes deeper, sometimes paler, and frequently mixed with green. It is soft, tender, and light; of an even but somewhat dusty surface; it adheres firmly to the tongue, and is dry but not harsh to the touch. It easily breaks between the fingers, and does not stain the hands

It is of a brackish disagreeable taste, and does not ferment with acids. It is a scarce fossil; but is found very pure, though in small quantities, in the mines at Gosselaer in Saxony. It is frequently found spotted with green, and sometimes with black; and very often is mixed among the green ochre, called 'berggruen' by the Germans, which has hence been erroneously called by its name. See BICE.

ARMIGER, or ESQUIRE, a title of dignity, belonging to such gentlemen as bear arms; and these are either by courtesy, as sons of noblemen, eldest sons of knights, or by creation, such as the king's servants. See HERALDRY.

ARMILAUSA, in antiquity, a short military coat, reaching down only to the knee; so called, as being divided both before and behind, and only close about the shoulders. The word is sometimes also written armelausa, armelausia, armicasia, and armilcasia.

ARMILAUSA, in ecclesiastical writers, the scapular of monks and canons; so called on account of its hanging from the arms.

ARMILLA, a bracelet for the arm, which captains, among the Romans, gave to their soldiers for their good conduct. Also tne small rings or braces that go round the necking of the Doric capital.

ARMILLA, in zoology, one of the vermes infusoria, belonging to the genus leucophra, described by Müller in his Zool. Dan. It is invisible to the naked eye, annular, and rather thickened above.

ARMILLA MEMBRANOSA, a name given by some anatomists to the annular ligament.

ARMILLARIS, in zoology, one of the vermes mollusca species, in the genus nereis; found burying itself in the sands of Norway and Sweden. It is subdepressed, peduncles conic, cirri lenticular.

ARMILLARY. *Armilla*, a brace or bracelet for the arm. Armillary, armilla, an armillary sphere. A figure consisting of several concentric circles intersecting each other, representing the various lines on an artificial globe; as the equator, ecliptic, &c.

When the circles of the mundane sphere are supposed to be described on the convex surface of a sphere which is hollow within; and, after this, you imagine all parts of the sphere's surface to be cut away, except those parts on which such circles are described; then that sphere is called an *armillary* sphere; because it appears in the form of several circular rings or bracelets put together in a due position.
Harris's Description of the Globes.

ARMILLARY SPHERE, an artificial sphere, which revolves upon its axis within a silvered horizon, which is divided into degrees, and movable every way upon a brass supporter. The other parts are the equinoctial, zodiac, meridian, the two tropics, and the two polar circles. The armillary sphere of glass constructed by Dr. Long, in Pembroke-hall, Cambridge, is eighteen feet in diameter. The lower part of the sphere invisible in England is cut off: the whole apparatus is so contrived, that it may be turned round with as little labor as it takes to wind up a jack.

ARMILLARY TRIGONOMETER, an instrument first contrived by Mr. Mungo Murray, and improved by Mr. Ferguson, consisting of five semi circles; viz. meridian, vertical circle, horizon, hour circle, and equator; so adapted to each other by joints and hinges, and so graduated and divided, as to serve for expeditiously resolving many problems in astronomy, dialling, and spherical trigonometry. For the drawing, description, and method of using it, see Ferguson's Tracts.

ARMILLATI MILITES, those who wore bracelets on their left arms bestowed on them by their generals or emperors. The term is more frequently applied to soft and effeminate soldiers, who wore bracelets on their arms, not as the rewards of their prowess, but marks of their foppery.

ARMILLATUS, a species of cerambyx, found in India, with four spines on each side of the thorax; the wing-cases ferruginous, and a single tooth on the posterior thighs.

ARMILUSTRIUM, in Roman antiquity, a feast held among the Romans, in which they sacrificed, armed, and with the sound of trumpets.

ARMINIANS, a religious sect, which arose in Holland by a separation from the Calvinists, and so named from ARMINIUS (see that article), who, thinking the doctrine of Calvin, with regard to free-will, predestination, and grace, inconsistent with scripture, and repugnant to all just ideas of the divine benevolence, began to express his doubts concerning them in the year 1591; and upon farther inquiry adopted sentiments more nearly resembling those of the Lutherans than of the Calvinists. The controversy thus begun became more general after the death of Arminius, in the year 1609, and threatened to involve the United Provinces in civil discord. The Arminian tenets gained ground under the mild and favorable treatment of the magistrates of Holland, and were adopted by several persons of merit and distinction. The Calvinists, or Gomarists, as they were now called, appealed to a national synod: accordingly the synod of Dort was convened by order of the States General, in 1618, and was composed of ecclesiastical deputies from the United Provinces, as well as from the reformed churches of England, Hesse, Bremen, Switzerland, and the Palatinate. The principal advocate in favor of the Arminians was Episcopius, at that time professor of divinity at Leyden. It was first proposed to discuss the principal subjects in dispute, and that the Arminians should be allowed to state and vindicate the grounds on which their opinions were founded; but some difference arising as to the proper mode of conducting the debate, the Arminians were excluded from the assembly, their case was tried in their absence, and they were pronounced guilty of pestilential errors. In consequence of this decision they were treated with great severity, and deprived of all their posts and employments; their ministers were silenced, and their congregations were suppressed. However, after the death of Prince Maurice in 1625, the Arminian exiles were restored to their former reputation and tranquillity; and, under the toleration of the state, erected churches, and founded a college at Amsterdam, where their first theological professor was Episcopius. The Arminian system has very much prevailed in England since the time of Arch-

bishop Laud, and its votaries in other countries are numerous.

ARMINIUS (James), whose name in Low Dutch was James Hermanni, a famous Protestant divine, from whom the modern sect of Arminians (see the preceding article) take their name, was born at Oude-water, in Holland, 1560. He was ordained minister at Amsterdam on the 11th of August 1588; when he soon distinguished himself by his sermons, which were remarkable for their solidity and learning, and gained him universal applause. Martin Lydias, professor of divinity at Francker, judging him a fit person to refute a work in which Beza's doctrine of predestination had been attacked by some ministers of Delft, desired Arminius to undertake the task; which he did, but, upon thoroughly examining the reasons on both sides, he came into the opinions he proposed to destroy, and afterwards went still farther than the ministers of Delft had done. In 1600 he opposed those who maintained that ministers should subscribe the confession and catechism every year. In 1602 a pestilential disease raged at Amsterdam, during which he acted with the greatest resolution and courage, in assisting the poor and comforting the sick; and Lucas Trelcatius and Francis Junius dying of that disease at Leyden, the curators of that university chose Arminius professor of divinity there, and afterwards made him D.D. Disputes upon the sovereignty of grace were soon after kindled in that university; and he was at length engaged in a new contest, occasioned by a disputation concerning the divinity of the Messiah. These contests, his continual labor, and the concern of seeing his reputation blasted by a multitude of slanders in relation to his opinions, impaired his health and constitution, and threw him into a fit of sickness, of which he died on the 19th of October, 1609. Arminius was esteemed an excellent preacher: his voice was low, but very agreeable; and his pronunciation admirable: he was easy and affable to persons of all ranks, and facetious in his conversation amongst his friends. His great desire was, that Christians would bear with one another in all controversies which did not affect the fundamentals of their religion; and when they persecuted each other for indifferent points, it gave him the utmost dissatisfaction. The curators of the university of Leyden had so great a regard for him, that they settled a pension upon his widow and children. He left several works, viz. 1. Disputationes de diversis Christianæ religionis capitibus. 2. Orationes, itemque tractatus insigniores aliquot. 3. Examen modesti libelli Gulielmi Perkinsii de prædestinationis modo et ordine, itemque de amplitudine gratiæ divinæ. 4. Analysis capitis noni ad Romanos. 5. Dissertatio de vero et genuino sensu capitis septimi epistolæ ad Romanos. 6. Amica collatio cum D. Francisco Junio de prædestinatione per literas habita. 7. Epistola ad Hippolytum a collibus.

ARMIP'OTENT. Lat. *armipotens*, from *arma*, arms, and *potens*, powerful. Strong, powerful in arms.

The manifold linguist, and the *armipotent* soldier. *Shakspeare.*

For, if our God, the Lord *armipotent*,
Those armed angels in our aid down send.
That were at Dathan to his prophet sent;
Thou wilt come down with them. *Fairfax.*

Beneath the low'ring brow, and on a bent,
The temple stood of Mars *armipotent*. *Dryden.*

ARMIRO, a sea-port town of Macedonia, in European Turkey, seated on the Gulf de Volo, thirty miles N. W. of Negropont. It is the Eretria of the ancients.

AR'MISTICE. Lat. *arma*, arms, and *sto-steti*, to stand, to cease. A cessation or suspension of arms.

Many reasons of prudence might incline the king of England to this *armistice* more desirable than a continuance of the war. *Lyttleton.*

ARMOISIN, a silk stuff, or kind of taffety, manufactured in the East Indies, at Lyons in France, and at Lucca in Italy. That of the Indies is slighter than those made in Europe.

ARMORACIA, in botany, a name given by the ancients to a kind of radish.

ARMORIC, or AREMORIC, something that belongs to the province of Bretagne, or Britany, in France. See ARMORICA.

ARMORIC LANGUAGE, the language used among the inhabitants of Britany. The French usually call this language Bas-breton. The inhabitants of Britany, of Cornwall, and of Wales, formerly understood each other's speech; but considerable diversities have crept in since their separation from each other. The inhabitants of Britany, Mr. Lluyd observes, by their intercourse with the French, have much altered their ancient orthography. There are several words in the Armoric which have no affinity with the Welsh: and both the Armoric and Cornish retain several ancient words and phrases which are now lost in the Welsh. Julian Manoir, a Jesuit, has published an Armoric grammar and vocabulary in French, which has been translated into English by Mr. Williams, and published with notes by Mr. Lluyd. Yvon Quillevere published an Armoric vocabulary at Paris, in 1521. Toland has given a catalogue of several Armoric words, which prove to be Irish; also a vocabulary Armoric and Irish.

ARMORICA, the ancient name of the whole northern and western coast of Gaul, from the Pyreneans to the Rhine; under which name it was known even in Cæsar's time. The word is of Bas-breton origin, and denotes maritime; being compounded, according to M. Menage, of ar, upon, and mor, sea.

ARMORUM CONCUSSIO, the clashing of armour practised by the Roman armies previous to an engagement, and intended to strike a panic into their enemies.

ARMOUR.

ARMOUR more particularly describes any defensive habit, used to protect the person of the wearer from the attack of an enemy; or abstractedly, to any part of such habit. Armour, in the aggregate sense, is frequently called harness by the English writers of the fifteenth and sixteenth centuries, as well as in our ancient statutes.

The public has lately been favored with a very valuable acquisition to the history of armour: indeed, when we name Dr. Meyrick's beautiful and copious work on this subject (A Critical *Enquiry* into Ancient Armour, three vols. large 4to. 1824), we mention the only standard and chronological work of this kind in our language.

Arms, that is to say, offensive weapons and missiles, gave their own character to armour, or the various defensive methods of resisting the weapon or stroke. From the above work, and some private sources, we shall digest a chronological view of these inventions, so important in the ancient modes of warfare, exhibiting in Chapter I. The Arms and Armour of the Ancients and of Barbarous Nations. Chapter II. Those of the British Isles under their native chiefs and successive masters, the Anglo-Saxons, Danes, &c.

CHAPTER I.

Of the Arms and Armour of the Ancients and of Barbarous Nations.

Sect. 1.—Arms of this Period.

The *club* seems to have been the earliest of offensive weapons. Being used in close fight, it gave its name φαλαγξ to the compact body of troops so called by the Greeks. The Assyrians and Ethiopians of Xerxes' army had clubs of wood armed with iron. Commodus as Hercules-Romanus is represented on coins with a knotted club, with two square belts of iron; and Winckleman has published one borne by Mars, which consists of a handle with only a round knotty knob. The Scythians united the spiked club with the mace, as exhibited plate I. fig. 15. On the Trajan column the Dacians appear with clubs, as slaves to whom no other arms were allowed. Du Cange mentions the vulgastus, a crooked club; the plumbata, loaded with lead; the spontonus, with iron. Our apprentices, according to Stowe, Douce, &c. used to carry clubs when lighting their master or mistress home: and in the army of Charles I. untrained rustics were denominated clubmen.

The club, says Dr. Meyrick, soon gave way to the *mace*, which had its name, κορυνη, from the little horns or spikes by which it was surrounded. It occurs in Homer. A Greco-Egyptian one has a guard for the hand. Plate I. fig. 6. The Assyrians had them of wood, headed with iron. One of the Greek maces in a horseman's hand occurs on an old coin, and several brazen mace-heads, which prove that the handle was originally of wood, may be seen in the British Museum. The origin of the corporation mace is thus given by Dr. Clarke: the sceptre of Agamemnon was preserved by the Chæroneans, and seems to have been used among them after the manner of a mace in corporate towns; for Pausanias relates, that it was not kept in any temple appropriated for its reception, but that it was annually brought forth with appropriate ceremonies, being honored by daily sacrifices; and a sort of mayor's feast seems to have been preserved for the occasion; a table covered with all sorts of eatables being then set forth.

The club also originated the *battle-axe*; under which term may be classed the large Egyptian double-axes, used by commanders of ships; and the battle-axe, plate I. fig. 9. with a weight on the back of the blade; Greco-Egyptian, as well as the sagares or double-axe of the Scythians.—There were also battle-axes termed bipennis, or double-bladed; crescent-formed, with long handles; with handles knobbed at top, and pointed at bottom; fire-shovel formed, &c. and others have hammers on both sides, or a hatchet and hammer; broad and sharp on both sides, used by sacrificers, wood-cutters, and sailors in sea-fights. These were Phrygian and Amazonian weapons. Plate I. fig. 20, 21, 22, 23, are specimens.

Among the Greeks we read of the Κελευς, with a short handle, at its top an axe-blade, and a pike opposite: and the αξινη, or pole-axe, formed of a staff, on the end of which was a spike, with an axe-blade on one side, and another spike on the other. With this weapon Agamemnon encountered Pisander.

The invention of the *spear* has been ascribed to the Ætolians, but it is no doubt beyond the date of history. The Romans, at a very early period, worshipped Mars under the form of a spear; a custom derived from the Sabines. Varro says, that from this came the custom of arming the statues of the Gods with a hasta pura. Spears were kept at home in cases, and it was customary also to put them against a column; whence, says Dr. Meyrick, originated the fluted pillars of ancient and modern architecture. They were adorned with banderolls, and carried at funerals inverted. To present the spear by the middle was to request a suspension of the battle. Both javelins and spears, although the latter was designed principally for thrusting, were used occasionally either for that purpose, or as missiles. Plate I. fig. 11 is a Greco-Egyptian quiver of javelins, with a throwing stick: fig. 12, is the throwing-stick separate.

The Greco-Egyptian spear had the common myrtle-leaf, as it appears on the bas-reliefs of the temple of Carnac; but Dr. Meyrick ascribes the era to the Ptolemean dynasty. He has engraved a quiver, containing javelins with a throwing-stick. Plate I. fig. 25, 26, are Thracian lances or javelins.

The Grecian spear, ογχος, was generally of ash with a leaf-shaped head of metal, and furnished with a pointed ferrule at the butt, called Σαυρω-

τηρ, with which it was stuck in the ground, a method used, according to Homer, when the troops rested on their arms, or slept upon their shields.

The αγκυλα and amentum were javelins which had thongs in the middle for impelling them further. The cestrosphendonus was a Macedonian instrument, much shorter, and darted by two thongs of unequal length. The aclides were short and thick, stuck with points, and pulled back after attack.

Αιγανιη, γνοσφος, and εφεσος, were javelins, of which the form of the heads may be seen in Stuart's Athens,' iii. 4. 'Several of them, says Dr. Meyrick, 'were loose upon their shafts, in all probability having attached to them a cord, which was held by the side of the wood, so that, when the weapon once entered the body, the head could not be extracted without the greatest difficulty. I am led to this conclusion from an Asiatic javelin, in my son's collection, on this principle, and which, like them, has just below the blade a hook turned backward to prevent its being withdrawn.' *Introd.* xxxvii. The double-pointed lance, mentioned by Homer, was afterwards adopted by the Romans. The δορυ, says Dr. Meyrick, was probably that used by the cavalry, and furnished with a loop of leather, which served the warrior for a support when he chose to let it hang from his arm, and to twist round his hand for the firmer grasp when charging. This strap was called μεσαγκυλη, being put on about the middle.

Hunting spears in Xenophon and Pollux had two salient parts, sometimes three crescents, to prevent the advance of the wounded animal. The French antiquaries distinguish hunting spears from others by their having no barb. The κοντος was a long lance used in the defence of ships; some similar were used by the cataphracti, or heavy-armed cavalry. The mounting spear had a step annexed to the staff, by which the horseman, having leaned the spear against the horse, ascended.

The Roman contus was a hunting spear, short, with a single point; used as a missile by the contarii. With a crook added it became the contus nautarum, or boatman's hook. The hasta was a spear for darting, one finger thick, four cubits and a half long. The javelins carried by the Velites, or light troops, were about two cubits long, with so slender a point that they bent at the first hit, and could not be returned by the enemy. After the conquest of Greece, the javelin more firm, and capable of being used at both ends, was adopted. The lupus was like a boathook to lay hold of besiegers. The pilum was about seven feet long; the head had a hook to retain it in the buckler after piercing: it was thrown just before attack with the sword.

The barbarian spears had sometimes wicker instead of iron tops. The framea was very long, with a short and narrow blade of iron. The Ethiopian, with heads of goat's horns sharpened. The Parthian, a large ball at the butt end, a lozenge-shaped blade at the other. Thracian spears had a shaft composed of little bands, perhaps of cane, and becoming larger towards the head, where it terminated in a round ball; head pyramidal, or a spike. The martlo-barbulus, or mattium, had on one side a long iron, on the other a hammer. A trident, or three-pointed spear, was adopted by the gladiators from the barbarous nations, and called retiarii.

Diodorus says, that the Gauls for darts cast those called lankia, whose iron blades are a cubit or more in length, and almost two hands in breadth. Propertius attributes to them the gæsum. On coins the head is barbed, and resembles that of an arrow. The gæsum was the missile lighter than the pilum of the heavy armed, whence two were generally carried. Those of the Franks were spears with a fleur-de-lis head called the angon, whence the royal arms of France.

The Lacedæmonians were the only classical nation of antiquity who used crooked *swords*; those of the other nations being uniformly straight. But the Spartan swords were very short and curved. The thin-bladed narrow sword of the moderns was utterly unknown. The distinction between ancient and more recent swords, seems to have been the addition of a guard for the fingers; for though one of a single bar occurs among the Etruscans, yet no other instance is mentioned by Dr. Meyrick. The Greco-Egyptian was a cutting sword with cord and tassel at the hilt, ARMOUR, plate I. fig. 1; a scimitar with double cord to the hilt, fig. 2; or a long dagger with double cords, resembling those now used by the Moors and Turks, fig. 5.

The Greeks of the heroic ages wore the sword under the left arm-pit, so that the pommel touched the nipple of the breast. Generally the sword was almost horizontal. It hung by a belt. The length was nearly that of the arm. The scabbard, of the same breadth as the sword, was terminated in a knob. Dr. Meyrick thus describes the Greek swords: 1. The ξιφος, worn at the left hip, suspended from a leathern strap, which passed over the right shoulder. It was straight, intended for cutting and thrusting, with a leaf-shaped blade, and not above twenty inches long; see plate I. fig. 32. It therefore reached only to the thigh. It had no guard but a cross-bar, which, with the κολεος or scabbard, was beautifully ornamented. The hilts of Greek swords were sometimes of ivory and gold. 2. The Argive κοπις, fig. 36, from the name seemingly intended for cutting, had its edge in the inner curve of the blade. Its scabbard is represented plate I. fig. 33. The ξυναι or ξυηλαι, Lacedæmonian swords, were all of the short cutting kind. The acinaces, or curved dagger, with the edge in the inner curve, was borrowed from the Persians at a later period of Greek history. The machaira or dagger was more frequently used for a knife, but worn in the scabbard of the sword. It is mentioned by Homer. Inlaying of sword-blades and hilts with gold is very ancient, being mentioned by Herodotus. Plate I. fig. 18, are Dacian and Thracian swords.

The Romans, says Dr. Meyrick, had brazen swords in their infant state. Latterly they were of iron, the hilts of brass or copper. It seems exceedingly probable, that sword-blades of mixed metal hardened were in use among the European nations, both before and since the gladii of steel

or iron hardened were the chief offensive weapons of the Roman heavy-armed infantry. The length of the blade was from nineteen to twenty-one inches. Polybius says, that down to the time of Annibal the Romans used the Greek or Etruscan sword; but that they then adopted the Spanish or Celtiberian steel double-edged cut and thrust, the gladius described above. Plate II. fig. 11, is a Roman sword and scabbard. The ages of Roman swords may be thus ascertained (leaf-shape excepted), the more obtuse the point the older, the last form of the blade being like the modern. The dagger of Brutus upon his coins certainly tapers broadly downwards, and so do other daggers; but the parazonium retained the obtuse Greek point. Dr. Meyrick mentions a Roman dagger not a foot long, and much resembling a French bayonet blade. The swords had ferrules. On which side the sword was worn appears not to have been settled till the time of Trajan, upon whose column the emperor, pretorian officers, tribunes, and centurions, always wear it on the left; all others on the right. Under Augustus the right of wearing a sword was confined to military men and certain magistrates.

The barbarian swords were crooked like scimitars; but straight swords, resembling the Greek, sometimes appear. Those of the Gauls and Celtiberians were also straight. The spatha, a large sword, like the Gaulish below, distinguishes the Roman auxiliaries. Leaf-shaped swords were used by the Etruscans and Samnites. The Cimbri had swords of unusual forms, and, according to Plutarch, long swords, seemingly the degans or spads, so highly prized as to be sometimes considered from its cruciform shape, the symbol of Deity. They were sharp, and often inscribed with Runic characters; and, in order to excite terror, those of the chiefs had proper names. The Gauls had very large swords.

The Roman *dagger* was called pugio and parazonium. Centurions and tribunes carried a sword and dagger. The latter became a mark of imperial sovereign power, and the pretorian prefect carried it, sometimes the emperor himself. Galba wore his hung to his neck. Poniards stuck in the girdle are distinctive attributes of the secretaries of the emperors of Constantinople. They were called ἐγχειρίδια. All the barbarous nations were noted for splendid baudricks. That of Darius was of gold.

Amongst ancient missiles, *bows and arrows* were conspicuous. The subject of archery has been before treated, but we add the following particulars from Dr. Meyrick. The Greco-Egyptians appear in a car, using the bow. They were also curious in their quivers; plate I. fig. 7, is a quiver with its covering from Denon; fig. 8 is an arrow of the early people. The Ethiopians had bows four cubits long, with arrows proportionate, and pointed with sharp stones instead of iron; the Jews had bows of brass; the Arabs large bows made with a handle and two curved horns; the Persians long arrows made of cane and sharp bows; the Parthians bows made of two pieces, fastened into a handle; the Indians cane bows and arrows, the latter headed with iron; the Scythians made coverings to their quivers with the skins of the right hands of their enemies; the Scythian bows resembled a crescent or the letter C; the Mæotian bow was like the Scythian; the Sarmatian bows and arrows were of cornel wood, the piles of the latter being of wicker. The Caspians had bows of cane. Plate I. fig. 16, is a Phrygian quiver, bow and arrows; fig. 31, a Theban bow, case and quiver; fig. 34 is a Greek bow.

Greek Bows.—The short bow was made of two long goats' horns, fastened into a handle. The original bow-strings were thongs of leather, but afterwards horse-hair was substituted, whence they were called ἱππεια, and, from being formed of three plaits, τρικωσις. The knots were termed κορωνη and were generally of gold, which metal, and silver, also ornamented the bows on other parts. The arrow-heads were sometimes pyramidal, whence the epithet τετραγωνια, and the shafts were furnished with feathers. They were carried in a quiver, which, with the bow, was slung behind the shoulders. Some of these were square, others round. Many had a cover to protect the arrows from dust and rain, and several appear on fictile vases to have been lined with skins. As the Greek bows were small, they were drawn not to the ear but to the right breast.

Roman Bows.—The sagittarii, or archers attached to the legion, were of various nations, but chiefly from Crete and Arabia. The arrows which they used had not only their piles barbed, but were furnished with little hooks just above, which easily entered the flesh, but tore it when attempted to be withdrawn. The bow-string was made of horse-intestines. The mode of drawing it was with the fore finger and the thumb, as the Amazons do on the vases.

The term falarica signified variously:—1. A halberd. 2. A pike with a very long head, and a bowl of lead at the other end. 3. A kind of arrow shot against wooden towers. Sulpitius makes the head iron, and the wood hardened with sulphur, bitumen, resin, and surrounded with tow steeped in oil, in order to be lit and discharged from a balista.

Pliny ascribes the invention of the *sling* to the Phœnicians, but its true origin is undoubtedly beyond the date of authentic history. The Jewish slingers are said to have been so expert, that some hundreds of them in one army could sling stones to a hair's breadth and not miss, a circumstance which explains the adroitness of David. The Greeks had ακροβολισται, or mounted slingers. The σφενδονη, or sling, says Dr. Meyrick, was especially the weapon of the Acarnanians, the Ætolians, and the Achæans, who inhabited Ægium, Dyma, and Patræ, but the last of these so far excelled, that when any thing was directly levelled at a mark, it was usual to call it Αχαικον βελος. It was sometimes made of wood, and sometimes of leather, and is described by Dionysius, as having its cup not exactly hemispherical, but hemispheroidical, decreasing to two thongs at its ends. Out of it were cast stones or plummets of lead called Μολυβδιδες, or μολυβδιδαι σφαιραι, some of which are engraved by Stuart on the upper part of plate XXVII. in the third volume of the Antiquities of Athens. They are spheroidical, hav-

ing an ornament on one side, and the word δεξας on the other. We are told that some of these weighed no less than an Attic pound, i. e. an hundred drachms. Small ones may be seen in the British Museum. According to the size of them the slings were managed by one, two, or three cords. At a later period the Greeks had a method of casting from their slings πυροβολοι λιθοι, or fire balls, and from their machines σκυταλια, made of combustibles, fitted to an iron head, which, being armed with a pike, stuck fast into its object, that it might be more surely inflamed. The funditores or slingers of the Roman armies were generally, says the same author, from the Balearic Isles, Majorca, Minorca, &c. or Achæans. Amongst these nations mothers are said to have allowed no food to their children which they did not beat down with the sling. They shot much larger stones than other nations, and with the powers of a catapult, so that in sieges they grievously galled the troops on the ramparts, and in the field broke the armour in pieces. Froissart says the same thing of them in the middle age. Ovid mentions their use of balls of lead, which, Dr. Meyrick says, they introduced. They appear to have been of the form of olives, and are inscribed with Greek or Latin characters. Aldrovandi has also published others with fugitivi peritis, and ital. and gal. On others are feri. Stones were also used, but as they could not always be got proper, these leaden balls were cast. The Romans, as did the Greeks, called a mounted ring a sling, from the resemblance of the circle of the ring to the leather enclosing the stone, &c. The sling appears to have been a long narrow piece of leather or stuff, the two ends of which were held in the hand, and the stone put in the folding at the bottom, one of the ends having a loop for the fingers, that when the stone was thrown the sling might not slip out of the hand. The Achaian slings were made of a triple cord. The fustibulum was a sling annexed to a stick.

Sect. 2.—Armour of this Period.

Armour, says Dr. Meyrick, had its origin in Asiatic effeminacy. The warlike Europeans at first despised any other defence but the shield; but, in order to be on an equality with their neighbours, were obliged to have recourse to further artificial protection. The progressive kinds of armour appear to have been these: 1. Skins. 2. Hides, padded linen, matted stuff or wood. 3. Leather armour with a rim of metal. 4. Plates or scales. Scaled armour on ancient monuments distinguishes barbarians from Greeks and Romans. Vegetius wonders by what fatality it happened that the Romans, after having used heavy armour to the time of Gratian, should, by their laying aside their breast-plates and helmets, put themselves on a level with the barbarians.

Of *helmets*.—It is certain that no helmet appears in classical eras, where the face was wholly covered by the junction of a movable visor and beaver. The first armour of the galerus kind was formed from the head and skin of an animal, especially of the lion; for the skin of a horse's head with the ears and mane, the mane serving for a crest, while the ears appeared erect on the head of the wearer, was an Indian and Ethiopian fashion, whence, thinks Dr. Meyrick, originated crests and tufts. Diodorus Siculus confirms this by saying that the crests of the royal Egyptian helmets were the heads of the lion, bull, or dragon. Plate I. fig. 3, 4, are Greco-Egyptian helmets, from Dr. M. The Milyans had helmets of skins; those of a fox formed the early Thracian helmet, and this ancient fashion of the heroic ages appears in the galerus of the Roman light troops, and the musicians and standard-bearers on the Trajan column. This custom gave birth to various forms and annexations of helmets and caps. The Phrygian bonnet, plate I. fig. 13 (originally represented by Mr. Hope), is the most ancient form of helmets; Dr. Meyrick suggests that the long flaps descending on the shoulders were probably cut originally out of the legs of the animals, whose hide or skin formed the body of the casque; and thinks this formed the original Trojan helmet. The helmet of Pluto, with a pendant falling upon each shoulder, given to him by the Cyclops in the war with the giants, and again given to Perseus when he killed Medusa, is a fine specimen. Two curious kinds, being the helmets of the goddess Roma, occur on the coins of the Aurelia and other families. The Sarmatians preserved the Phrygian form, with the neck-piece of scales; and this, which appears on the Trajan column, has given birth to a confusion with it of double-chained mail in Mr. Hope's specimen. Plate I. fig. 19, is a Dacian helmet. This bonnet, as well as the long trowsers, was among the Greek artists a distinctive attribute of barbarians. The tiara helmet is Greco-Egyptian, Median, Persian (occurring at Persepolis), Hyrcanian, and Bactrian; with a flap hanging down behind, so as to form ear-pieces, as well as to protect the head and shoulders, Armenian. But all cylindrical helmets were not of this oriental character. Other helmets that have been specified by historians, are spiked helmets, like the Chinese. The Scythian conical helmet, and Dacian scull-caps, also with spikes. The casques of the Greek soldiers had only a long point or simple stud; those of officers crests and plumes. Plate I. fig. 17, represents a Syriac helmet, from Mr. Hope, much resembling, as Dr. Meyrick observes, that of the modern Chinese. The most extraordinary scull-cap is, however, the Grecian one, with a visor and neck-piece, presumed by Strutt to be anterior to the Trojan war. The conical helmet conformed to the shape of the head (plate I. fig. 14), and next to that demi-oval and sugar-loaf, is the most common form of helmets, but offers no characteristic of era or country. In general the barbarous nations have perpendicular demi-ovals. Horned helmets were worn by the Phrygians, though but rarely. They were adopted by the Greeks (plate I. fig. 30), and, according to Diodorus Siculus, by the Belgic Gauls. Being formed as typical of the religion of the country, and the horns of the ox or cow being emblematic of the moon, they were a fit accompaniment for the crescent-like shields. The Gauls, says Diodorus, wear helmets of brass, with large appendages for the sake of ostentation; for they have

either horns of the same metal joined to them, or the shapes of birds and beasts. The early Greeks used a helmet called περικεφαλαια, because it left only an aperture for the sight and breath. The part which came over the face was called Αυλωπις. The Samnite helmet is something like the περικεφαλαια, but, instead of the visor forming a part of it, it is put on the face like a mask, perforated merely for the eyes, and comes down to the collar bones. It is also furnished with a ridge. See plate II. fig. 5 and 6.

The Carians are said to have invented the crest of the helmet; but the real origin is that we have given. The earliest Greek helmet, as presumed, is that of Strutt; and the next apparent era (to judge with Dr. Meyrick from Etruscan specimens, which preserved the remains of the ancient Grecian style) is that where they are all ridge and crest, either of leather, strained upon a frame, or cut out of a solid wooden block; for such helmets are ancient. See Meyrick, xvii. xviii. &c. One of these very old helmets has a face-guard. See plate I. fig. 27; and plate II. fig. 1 and 4; the latter has the horse-tail, recently introduced in our cavalry. The succeeding era shows the visor, Phrygian, bird's neck with horns added. The Etruscan and ancient Greek fashions are known to have been alike; and some were five-crested, with a horse-tail besides; for it is noted by Mongez, that Homer never speaks of plumes in crests, only of horse-hair. The continental antiquaries class the Greek and Roman helmets as follows: 1. Helmets without crests, visors, and cheek-pieces, i. e. scull-caps. These are Etruscan, and of course early Greek. 2. Helmets with crests and panaches (i. e. the horse-hair appendages), but without movable visors and cheek-pieces. 3. Helmets, with movable visors without cheek-pieces. 4. Helmets with cheek-pieces, but no visor. 5. Helmets both with cheek-pieces and movable visors. 6. Singular helmets, with aigrettes, plumes, wings, horns, double crests, double cheek-pieces, (some of which are very ancient, being seen on the Hamilton vases,) and others with fantastical additions and over-loaded crests, either, in the main, barbarian, or subsequent to the removal of the seat of empire to Constantinople. Plate II. fig. 9, is a Roman helmet, now in the British Museum; fig. 12 is a more ornamented one, used in the time of the emperors. *Meyrick.*

A quilted pectoral hanging over the breast and shoulders, like a tippet, sometimes very curiously wrought, was the only body-armour of the Egyptians. See plate I. fig. 10. Ancient figures of Minerva have a pectoral of scale armour, with flap sleeves of the same, and among the Libyans, from whom was derived the Ægis, it was merely a skin, with a fringe of leather. The Jews had pectorals, 'the coats of mail of our translation of the Bible, probably first of linen, but afterwards of plates of metal, and called thoraces. The Assyrians, Medes, Susians, and Persians, had them of linen. The change of them into brazen thoraces was first made by the latter nation. Dr. Meyrick thinks the thorax of Homer and the Greeks to have been a large breast-plate made of leather, or perhaps brass, to which the shoulder guards were attached behind. Body-armour consists of thoraces, tunics, cuirasses, girdles, or belts.

The continental antiquaries call the military *tunic*, that worn under the cuirass. The Jews are presumed to have had a tunic, upon which the thorax was fastened. The Medes and Persians had tunics covered with plates like fish-scales, of scarlet or purple. The latter, in the time of Alexander the Great, had them embroidered with gold, the sleeves adorned with pearls. The Thracians, imitated in the retiarii, had short tunics or cuirasses, which came up to their breasts, and reached nearly half-way of their thighs. The Phrygians wore a tunic with tight sleeves down to the wrists, and covered with flat rings. Some Etruscan spearmen had quilted tunics with short sleeves; and their archers tunics of leather. Strutt's bronze Etruscan warrior has a short tunic, with no skirts on the sides below the girdle. It seems to have been made of stiff and rigid leather, but has only one sleeve of that material; that of the right arm, for the use of the sword, being of more flexible stuff. In Cæsar's time almost all the Roman Equites had quilted, stuffed, or felted tunics, or tegmenta. Some of these stuffed were steeped in vinegar, to render them hard; others were of leather, and both were edged with iron round the neck, and sometimes round the line of the abdomen. The light cavalry used such cuirasses. The Ligurian tunics were girt with a belt.

Cuirasses were made, 1. of folded linen or cloth, or felted with salt and vinegar, and used by the Egyptians, Ajax in the Trojan war, the Athenians, Alexander, &c. 2. Of leather sometimes used by the Sarmatian chiefs. Brass and iron were most common, of two pieces, and joined by a buckle at the shoulders. These were altered, through their heaviness, to plates upon leather or cloth; and both these and chain-mail, but not interlaced, says Dr. Meyrick, also occur. Plate I. fig. 28, represents a cuirass with the girdle as passing over the shoulder-pieces. Gold plates distinguished the Greek and Roman generals. The soldiers on the Trajan column wear a short leathern tunic, like a waistcoat, upon which plates of metal were sewed. The plates were sometimes superseded by small chains. The Etruscan cuirasses were plain, scaled, ringed, laminated, or quilted. See plate II. fig. 3. Dependent from their cuirasses were straps, sometimes merely of leather, at others with pieces of metal on them, and these appendages, termed by the French lambrequins, were, together with their plain and laminated cuirasses, adopted by the Romans. But several changes took place afterwards. On the Trajan column we find the lorica of the hastati and principes, consisting of several bands of brass or steel, each wrapping half round the body, and therefore fastening before and behind on a leathern or quilted tunic. These laminated loricæ were very heavy. The Roman lorica was frequently enriched on the abdomen with embossed figures, on the breast with a Gorgon's head, for an amulet, on the shoulder plates with scrolls of thunderbolts, and on the leather border, which

covered the top of the lambrequins, with lion's heads formed of the precious metals. The compact cuirass was made to open at the sides, where the breast and back plates joined by means of clasps and hinges. The lorica of the triarii were of leather only. In the time of Marcus Aurelius they had cuirasses of scales or leaves of iron, called squammatæ or plumatæ, a fashion first adopted from the Dacians or Sarmatians by Domitian, who, according to Martial, had a lorica made of boars' hoofs stitched together. When the lorica was of one piece, whether of leather or metal, and reached to the abdomen, it had the pendent flaps, called lambrequins, before-mentioned, made of leather, fringed at the bottom, and sometimes highly ornamented. At the time of Trajan the lorica was shortened, being cut straight round above the hips; and then there were overlapping sets of lambrequins to supply the deficiency in length, and generals thus habited may be observed on the Trajan column. The Roman cavalry did not at first wear loricæ, but afterwards adopted the Greek arms, and then were called loricati. Plate II. fig. 7, is a Roman general's lorica with its zone. In the time of Constantine the Great, the cataphractes or heavy horse, the same as the Persian Clibanarii, had flexible armour, composed of scales or plates; and rings held together by hooks and chains the lorica hamata, which, however, is much older than the period mentioned. The Sicilian cuirasses, like those of the ancient Greeks, consisted of back and breast-pieces with lambrequins. Plate II. fig. 2 is a Samnite cuirass and gorget.

Belts, or *Girdles*, were plated with metal, and covered the body below the pectoral, among the Jews. The Scythian body-armour on the Theodosian column consists of a tunic, wadded, with a girdle and cross-belts of leather studded; the sleeves very short, but secured with two bands, like the belts. The Greek girdle, ζωνη, very rich and varied, bound the armour together, whence ζωνεσθαι became a general word to imply putting on armour. In Homer, the girdle was not worn directly above the loins, but just below the chest.

The arms of the Greek warriors (very early ages excepted) appear naked; but among the Romans of rank, lambrequins or straps richly adorned and fringed protected the upper arms. Plate I. fig. 35, represents the inside and outside of a Grecian greave for the right leg.

Dr. Meyrick observes that 'in ancient times the shape of the *shield* had much to do with the mythology of the people, and therefore were circular to represent the sun, crescent-like to imitate the moon, &c.' The ivy-leaf was sacred to Bacchus, and it might be from this people that the Greeks derived the pelta, which Xenophon describes as of the same form. The first shields were of basket-work, to which succeeded light wood. Ox leather, covered with metal plates, was, however, the most useful material. The middle had a plate of metal (Latin, umbo), often furnished with a thread of metal, turned in a circle or spirally. At first the shield was carried by a piece of leather, suspended from the neck over the left shoulder. This apparatus often appears upon Etruscan monuments. The handles of shields, says Herodotus, were inventions of the Carians. When, after war, the shields were suspended in the temples, the handles were taken away, to prevent their being of service in sedition. Æschylus says that bells were sometimes added to shields, to affright enemies by the sudden sound, but Dr. Meyrick could not find a specimen. The Carians also introduced the ornaments of symbolic or allegorical figures, attesting the antiquity of their origin, and the valor of their ancestors. The Peloponnesians engraved their initials upon their shields, in order to distinguish themselves in battle. Thus upon their coins often occurs only a monogram of the two first letters of their names. The Greeks carried the shield upon either arm, as do some gladiators in Stosch, the paintings of the Villa Albani, &c.

The shields of different nations have almost endless distinctions. The Greco-Egyptian resembled a gate, oblong, with the top rounded, convex and a hole in the middle. Meyrick ii. pl. i. f. 5.—The Ethiopian was made of raw ox-hides. Id. iii.—The Jewish and Philistine was of four kinds at least, all of different sizes. Goliah had two shields, the smaller probably hung at his back by a strap, whence he could easily take it, if required, in time of action. The larger one was carried before him by his armour-bearer. Id. iv. 6.—Plate I. fig. 24, is a Phrygian shield of great elegance. Fig. 29, is a Theban shield, copied from the Persian gerra. The Assyrians and Chaldeans had bucklers after the Egyptian manner. Id. viii.—The Persian shield, or a fiddle-shaped, with an ornament in the centre. The Scythian oval. Id. xiii.

The Grecian cavalry of the first era used long shields, but Philomænes introduced a round light one, not wider than necessary to cover the body. The infantry at first used oblong shields, but these Philopœmen changed to the Argolic shield. The original Greek shield was, however, the ασπις, a perfect circle, made of several folds of leather, covered with plates of metal, laid one over the other, and about three feet in diameter, in order to reach from the neck to the calf of the leg; on which account Homer calls them αμφιβροτας and ποδηνηκεις, the warriors often by kneeling down and bending their heads, concealing themselves behind them. The cavalry had the λαισηιον a lighter and smaller round shield composed of a hide with the hair on. The light infantry used the Pelta.

The hastati and principes (heavy Roman infantry) used the scutum, a hollow hemi-cylinder shield, a convex hexagon, or that shape, with its side angles rounded off. It was generally four feet long, by two and a half broad; and made of wood joined together with little plates of iron, and the whole covered with a broad piece of linen, upon which was put a sheep's skin or bull's hide, having an iron boss jutting out in the centre, of great service in close fighting; plate II. fig. 8, is a specimen. The triarii, and sometimes the principes, used a clypeus or round buckler; or sometimes one of leather, of a square form, crimped into undula-

tions. The Velites carried the round shield called parma, about three feet diameter, made of wood, and covered with leather. The cavalry at first had bucklers made of ox hides, resembling, says Polybius, the concave loaves used in sacrifices; but being of little strength at any time, and utterly unserviceable when wetted with rain, the Greek arms were adopted instead. Thus Meyrick xli.—lvi. Mr. Hope states that the Roman shield seems never to have resembled the large round buckler used by the Greeks, nor the crescent-shaped one peculiar to the Asiatics, but to have offered an oblong square, or an oval, or a hexagon, or an octagon, and that the cavalry alone wore a circular shield, but of small dimensions, called parma. Costumes, i. 47. Every legion had the buckler painted of a particular color, and charged with distinctive symbols, as the thunderbolt, anchor, serpent, &c. To the symbols were added the peculiar signs of each cohort, and the names of the person to whom each buckler belonged. Veget. ii. 17. To preserve the paintings, &c. they were kept in leathern cases.—Dion. Cass. l. 42. c. 15. Xiphilin. in Domitiano. Rec. d'Antiq. 28, &c. Votive shields at first consisted of the spoils of an enemy, but at last were offerings made of the richest metals, finely wrought, even sometimes of marble. They were suspended in public places and buildings with peculiar ceremonies, and charged with inscriptions. Gruter, 441. n. 7. The ancilia, or sacred shields, which Montfaucon has oval, iv. p. i. b. 2. c. 6. are round upon coins of Domitian, and one of the moneyer Licinius, as in Ovid, Fasti, iii. 377. In eras posterior to the Antonines, nothing is more common than to see emperors holding a buckler in the left hand, adorned with divers figures; and after Constantine with the monogram J. C. It implied the protection which princes owe to their subjects.

Diodorus makes the shields of the Gauls proportionable to the height of a man, and garnished with his own ensigns. These Pausanias also calls Thureoi, adding, that they were introduced into Greece by Brennus. He tells us 'the Gauls had no other defence, and used them as rafts on crossing a river.' That carried, however, by the Parisian boatmen in the time of Tiberius Cæsar, and found sculptured at Notre Dame in 1711, appears to be hexagonal and convex, though long and narrow. Governor Pownall says, that the Gaulish shields, upon the triumphal arch at Orange, are of a long oval, with the two ends truncated, and had distinguishing marks. Livy and Appian say, that the Gaulish buckler was long and flat, but too narrow to cover a man.

The Scandinavians, and northern nations, had one kind of shield, a long oval, the skiold (whence our word shield) of wood, bark, or leather, and entirely covering the bearer; the other, smaller, convex, often furnished with a boss of iron, or other metal. They were made of iron or brass, and engraved, painted, or gilt; and sometimes covered with a plate of gold. The large shield served to carry the dead or wounded, or to swim across a river. It was white, until the bearer, by some exploit, had obtained permission to bear some distinctive mark.—*Meyrick*, lxi.

Goliah had *greaves*, as had the Lycians. Among the Greeks, they were the famous κνημιδες of Homer, of metal, (sometimes of bull's hide,) which rose in front to the top of the knee, nearly behind at the calves, and terminated just above the ancle. They were fastened behind, Dr. Meyrick says, with pieces of metal, ending in buttons, or with thongs or buckles. The Etruscans had them, apparently of rough hides, fastened behind by a single ligature, near the middle of the calf, which greaves subsequently gave way to buskins. The Samnites wore ornamented boots, reaching to the ancle and covering the instep; and over that on the left leg was placed a plate of brass, fixed upon a wadded wrapper. Servius Tullius introduced the Etruscan greaves among the Romans; but, from the time of the republic, the word ocreæ applied to the boots laced up, which succeeded them. The ocrea is described as a plate of metal, or piece of ox-hide, tied behind; but exceptions occur. It was common in the later ages to have only one of these greaves, mostly upon the left leg.

Dr. Meyrick says, that he has read of χειρις, *gauntlets*, or guards for the hands, but never seen any representation of them. A stiff leather cuff, like that of a coat, with a slit on one side, appears to cover the sword-hand of an ancient Grecian figure, engraved by Strutt. Plate II. fig. 10, is the Roman signum or principal standard for the infantry.

CHAP. II.

Of the Arms and Armour of the British Isles.

The early Britons had merely bows and reed arrows, with flint or bone heads, quivers of basket-work, oaken spears and javelins, with bone heads fastened by pegs, a flint battle-axe, called bwyelltarvau, plate II. fig. 14 and 17, and a cat, or four-edged oaken club, fig. 16 and 19. The Phœnicians taught them the art of manufacturing metals; and then the heads of the spears, javelins, and battle-axes were imitated in bronze, i. e. copper and tin mingled. The javelin, called gwaew fon, or fonwayw, had its blade generally a foot long, of a sword form, with an obtuse point, and short expanding base, and nailed in a slit of the ashen shaft, see fig. 15; the flat-bladed one of Phœnician introduction was called paled. They had also a broad-edged lance, leaf-shaped, called by the Irish lagean, and by the Britons llavnawr. See plate II. fig. 18. The Caledonians had a ball, filled with pieces of metal at the end of their lances, in order to make a noise when engaged with cavalry. This was called cnopstara. The third era of spears and battle-axes is, when, in imitation of the Phœnicians, they had shafts, into which the staves were fitted. All these weapons were of bronze, and in the Roman-British time were exchanged for steel, which marks the last era.

Their first body-armour was skins of wild beasts, (say rather of the brindled ox,) which, Tacitus observes, was exchanged after the Roman conquest for the well-tempered leathern cuirass, an armour which continued till the Anglo-Saxon era. Tacitus also mentions the

long-swords and small targets of the army of Galgacus, still retained in the claymores and targets of the Highlanders. The spathæ, or two-handed swords of the Gauls, were used both by the Britons and Irish, and were called cheddyv-hir deuddwrn by the former, and dolaimghen by the latter. The Irish had both straight and curved swords; the Britons straight ones, less than two feet in length, both kinds always of bronze. Plate II. fig. 20, is one. The sword was suspended by a chain, and the hilts seem to have been of horn. The scythe-blade of bronze annexed to the handle of the covinus, or war-chariot, was about thirteen inches long. After the Phœnician intercourse the shield was of bronze, retaining its circular form, and flat, rather more than two feet in diameter, ornamented with concentric circles and knobs, and held by the centre. See plate II. fig. 13. Their coins represent mounted warriors with scull-caps. The ornament of the Britons was the torque of gold, silver, or iron. There is also reason to suppose that the Britons used wooden slings. The cavalry had no saddles. The chiefs fought from chariots of which the essedum, with two horses, was the most famous. The covinus, with the scythe-bladed axles, was drawn by one horse only. It had flat circular solid wooden wheels; the body of box shape was of wicker, and the driver stood upon the shafts. The Welsh were famous archers; their bows were made of wild elm but stout, not calculated to shoot arrows to a great distance, but to inflict very severe wounds in close fight. Their arrows would pierce oaken boards four fingers thick.

Spear-heads in a sheath of wood have been found in barrows; but some of these weapons were rather perhaps ornamental daggers or knives. They are all pyramidal, narrowing at the base; those in bronze have the shaft, in which the wood enters, running up the middle of the blade to the point. Iron spear-heads of a similar form, but without the shafts mentioned, have also been found. Spear-heads with rivets were kept in a scabbard of wood. Ossian, in his Colna-Dona, mentions a youth with a shield and pointless spear; and, according to Macpherson, if a man, upon landing in a strange country, came with his spear forward, it betokened hostility; if he trailed it behind, friendship.

In the Wiltshire barrows have been found: 1. a two-edged sword two feet six inches long, and an inch and three quarters wide; 2. one of iron, which originally had an oaken handle, the blade being about eighteen inches long, two wide, and single edged; 3. another twenty inches long in the blade, and two inches wide; the handle set in wood, without a guard, double-edged, and terminating in an obtuse point. It had a wooden scabbard. Brass swords have been found in Wales; some flat, some quadrangular, several gilt; the handles probably of wood. They were from one to two feet long. See Gough's Camd. ii. 554. 568. The Britons had also a dagger, the εγχειριδιον of the Mæatæ in Xiphilin, and the dirk of the Highlanders. The Gauls had very large swords; but whether the one dug up at Long, near Abbeville, was the spatha, the long two-handed sword of Galgacus, the ensis sine mucrone of Tacitus, and that of Xiphilin, is not clear. That has been called the Highland claymore; but the more ancient weapon, the claymore, properly speaking, was a great two-handed sword used by the Highlanders; while that adopted by them more recently was called the clay-beg, or little sword. When the two-handed sword was disused, the distinction ceased, and the word claymore was indiscriminately applied to all. The modern basket-hilted broad sword (the basket being used to supply the place of a gauntlet) seems to take date with the reign of Elizabeth. The two-handed swords of later eras had a different origin. The British sword in Dr. Meyrick is leaf-shaped, without a guard, and a truncated cone handle, ending in a coronet-formed knob.

The battle-axe, or bwyalt-arv, had a single blade, in shape like the modern axe. The cat or club was of two kinds, one with a lozenge head, the other with a mushroom knob, serrated.

The *shields* of the Britannias on Roman coins are oval, with a spiked boss, and a rim sometimes studded. Others are plain, or have an ox's head, or S. P. Q. R. The umbo of a shield found in a barrow was a concave-sided half cone, ending in a knob. Dr. Meyrick's shield was excavated in Cardiganshire. The supposed curious one of wood, found at Hen Dinas in Shropshire, near a Roman foot in diameter, bound round with iron, and covered with iron net-work, and having the inside lined with three coats of leather, and furnished with a handle or strap to pass over the arm, with an umbo four inches long, terminating in a point, is pronounced by Dr. Meyrick to be a buckler of Henry the eighth's time. Ossian says, that he was declared General whose shield sounded loudest upon striking. Plate II. fig. 21 and 22, are British and Gaulish helmets given by Dr. M.

The Anglo-Saxons, says Dr. Meyrick, under Hengist and other followers, wore many of them coriets, i. e. loricæ of leather, and pyramidal four-cornered helmets; armour probably acquired through the alliance of their fathers with the Romans, under Carausius and his successors. See plate II. fig. 24, 25; fig. 23 is one of the Saxon helmets. Hengist is said to have had scale armour; and it plainly appears that the early Anglo-Saxons had four-cornered helmets with serrated crests; broad-bladed spears, and convex shields, with iron bosses, terminating in buttons. They had also swords and daggers. In the middle of the eighth century, they adopted the Phrygian tunic, covered with flat rings. After the conquest of England the lorica fell into disuse, the soldier appearing with only a shield, helmet (in general of leather), sword and spear. Towards the end of the ninth century, the leathern corslet, formed of hides, (called corium or corietum), was the armour generally used. See plate II. fig. 27. These were adapted to the shape of the body, and consisted of either one or more suits, put on over each other, the uppermost being shortest, and each terminating in leaves like a fringe; or else one suit with these jagged lambrequins dependent from it. When the tunic supplanted the lorica, the Roman pectoral or breast-plate halr beaph or beorg, 'neck-guard,'

breost-beoden, 'defence for the breast,' and breost-hocc, 'breast-plate,' was still retained. The form or materials are not ascertained. Dr. Meyrick thinks, that the vague accounts imply sometimes metal, sometimes wool or hair. Leg-guards, composed of twisted woollen cloth, also occurred among the early Saxons.

Dr. Meyrick and Strutt observe, that the Lehringed byrn, ringed byrne, which appeared in the eighth century as a tunic of leather, covered with rings, sitting close to the body, with three quarter sleeves, and descending to the knees, was appropriated to kings and principal chieftains. The custom of the Franks confirms this opinion, and also shows that they adopted this ringed cuirass from the Gauls (however originally Phrygian); for the Britons called it mael, and we are therefore justified in applying to it the French 'cotte de Mailles,' ascribed to the Gauls, especially as the former nation first wore leathern cuirasses like the Saxons, and the soldiers none at all till the next race of kings, which commenced in 752. This tunic of rings became afterwards a complete cuirass, sitting close to the body, and generally terminating with it.

The Cyne-healm, or royal helmet of the Anglo-Saxons, has the crown upon a casque; but that of the nobility is commonly a cone made of metal, which form lasts till the conquest. Sometimes it takes the form of the Phrygian bonnet. The soldiers' head-covering appears to have been a mere cap of leather, with the fur turned outwards. The form of their shield was oval, but of various sizes; from a magnitude sufficient to cover the body, to the diameter of a cubit. They are generally embellished with rows of studs in the form of a star.

The Anglo-Saxon *swords* were large and long, of iron or steel; the hilts of silver or gold; sometimes the sword was suspended from the shoulder, but the prevalent fashion was to gird it upon the side. The sword-belts were often not distinguished from the common girdle, with which the tunic was usually bound; yet this was not always the case; and the Saxon writers speak of them as adorned with gold, silver, and jewels. There were several sorts of swords; the sharp-pointed, the pointless, the two-edged, and the broad-sword. The seax was of the form of a scythe; and later swords of the Saxons and Danes were short and curved, slung by a belt across the right shoulder. Fig. 28, plate II. is the large shield used in this country by the early Saxon invaders; behind which are two Anglo-Saxon spears and two swords; above it Edward the Confessor's crown-helmet.

Their *spears* are of three sorts, the war-spear, the boar-spear, and the hunting-spear; but how they differed from each other is not known. The heads of the Anglo-Saxon spears are exceedingly long, and sometimes dreadfully barbed.

The *bow* is said not to have been a weapon of war among the Anglo-Saxons; but it was used by the contemporary Franks, as the Salic law shows, though historians have advanced the contrary. They used poisoned arrows; and thus destroyed the army of Quintius. The Anglo-Saxon bow was of the form of the Grecian, though longer.

The distinction of Danish from Saxon armour is very simple. The Anglo-Saxons wore their armour either as a tunic or cuirass, the Danes as a tunic which hung over pantaloons. Their swords were inscribed with mysterious characters, and called by names which might inspire terror. They also pretended to enchanted swords, which would pierce the best armour. Plate II. fig. 26 and 29, are Danish battle-axes; 30 is a Danish shield; 31 is a spear of Canute; 33 that of soldiers in Canute's prayer-book; 32 and 34 are a Danish sword and stone-mallet.

We now arrange the Norman and English arms and armour in the order of each succeeding reign.

William I. from A.D. 1066 to 1087.—The body-armour was of two kinds, leather and steel, with the conical nasal helmet. The former seems to be an improvement of the Anglo-Saxon; and the latter, in one of its forms, together with the helmet, to bear a strong resemblance to that of the Danes in the time of Canute. The leather, which consists of a tunic, with many overlapping flaps, has close sleeves which reach to the wrists, and was called corium and corietum. The steel armour consists of flat rings placed contiguously, such as had been worn by the Saxons; the mascles, such as had been adopted by the Danes. It appears to have been extremely heavy. The Normans, as depicted in the Bayeux tapestry, are for the most part habited in armour, which forms both breeches and jacket at the same time. This Dr. Meyrick takes to be the habergeon. The helmet of the Conqueror is of Greco-Roman fashion, conical, with a knob at top, and a rim somewhat resembling a coronet below, with or without a flap or neck-guard.

The principal weapon of the Normans was the lance, to which was sometimes attached the gonfanon, and sometimes the pennon; other weapons were long cutting swords; the pil, pilx, or pile, machue, club, mace, bow and arrow. The pil or pile (a weapon of the rustics in the army) was a piece of wood, cut smaller at one end than the other, resembling the Irish shillela, or more probably the pilum or dart. The machue was something of the club kind, but with a large head. Piles and maces were weapons of the Serfs. The adoption of the mace by the knights in general was later than the Conquest. The quivers, which were of a conical form, were worn sometimes on the hip, sometimes on the left shoulder. The bow only became a master arm under the Normans. The Saxons trusted to their infantry and close action; the Normans to their cavalry. The Normans first introduced the art of shoeing horses as at present practised in England. The Saxon saddles were little more than cushions; but the Norman, of Asiatic fashion, rose very high before and behind. The Norman spurs differed but little from those of the Franks and Saxons. The neck was somewhat shorter. The pyramidal head was rather concave on every side, which afterwards suggested the ring and spike of the pricked spur; and the shanks, instead of being straight, were curved. The portcullis was introduced by the Conqueror. The balista was probably only a staff-sling.

William II. or Rufus, from A.D. 1087 to 1100.—Nothing new in any part of armour appears in this reign, except perhaps the *Chapel de*

fer, of Saracen origin. It exactly resembles a Tartar cap, being a cone, which projects beyond the head. In offensive arms two curious weapons occur. The first is the morning star. The people of South Wales fought with staves, to which were attached iron balls covered with spikes, while those of North Wales had only swords and shields. This singular weapon was probably introduced by the Normans. The second was the oncin, a staff with a hooked iron head, somewhat like one horn of a pick-axe; the use of which was very serviceable for breaking through the apertures of the mascles.

Henry I. from A. D. 1100 to 1135.—The hauberk, as before, with its hood of the same piece, but with sleeves fitting close to the armour, terminating with gloves, manakins, or mufflers, which cover the outsides of the hands and fingers. It also reaches to the knees, and is finished by a broad gilt border. The shoes and hose of the former reign were now abandoned for coverings of the feet and legs made all in one. These were called chausses, and fitted close like modern pantaloons, fastening over the soles with straps. The mascles of the hauberk and chausses are sometimes square. Rustred armour seems to have grown out of the ringed. It consisted of one row of flat rings, about double the usual size, laid half over the other, so that two in the upper partially covered one below. Scaled armour also occurs; as does trellised armour. This was made like a vest, with straps of leather laid upon it, and crossing in opposite directions; these, by passing over each other, leave large intervening squares placed angularly, in the centre of each of which appears a round knob, or stud of steel. The tunic was of cloth, and in all probability a small plate of iron was fastened within by each stud, while the leather straps were intended to cover the parts at which they met. This light armour appears to have been taken from the Anglo-Saxon cross-gartering, and to have been copied by the Normans. The surcoat may be placed under this reign. The helmet, instead of being exactly conical, has its apex on a line with the nasal. The cylindrical helmet, worn obliquely, with a face-guard of a plate perforated with two crosses for the eyes, nostrils, and mouth, also occurs. The earliest specimen is perhaps that of Charles the Good, earl of Flanders, in 1122. This helmet became more general under the reign of John. In addition to the usual Chapel de fer, or wide iron conical cap, as well as the nasal heaume, we have now the chap de mailles, or cap of mail, a high tapering cap, but not pointed; and composed, like the hauberk and chausses, of rings set edgeways. Besides this, we have the first attempt at a movable visor, copied from Roman sculpture. It is perforated, and the helmet has attached to it cheek-pieces, hollowed out under the eye; so that they almost approach the nose. The practice of suspending the shield from the neck by a strap called guige and gige, a practice certainly introduced by the Normans, came into general use in this reign. The earliest specimens of hereditary armorial bearings also now appear on the shield; and the saddle-cloth first occurs in this reign, and the long-pointed toe used by the knights.

Of Offensive Arms.—The blade of the spear, ornamented with fluted work, appears to be at least eight inches broad, and twelve or fourteen long, being of the kite shape, inverted; the jagged or barbed form used by the Saxons having gone quite out of fashion. The gisarme and Welsh glaives were weapons of this era. The gisarme was distinguished from other weapons of the bill kind by a rising spike on the back. The Welsh glaives were cutting weapons; one edge being much in shape like the blade of a penknife, and had generally an ornament on the back.

Stephen; from 1135 to 1154.—The tegulated armour, consisting of several little plates, now appears covering each other in the manner of tiles, and sewn upon a hauberk without sleeves or hood. The shield of Stephen on the great seal was made to curve outwards at top. The standard on a carriage, of Asiatic origin, was now introduced here. The plastron de fer, an iron plate placed under the hauberk to raise it from the chest, the pressure of the former having been found injurious, was also introduced in this reign.

Henry II. from 1154 to 1189.—Little or no alteration in this reign.

Richard I. from A. D. 1189 to 1199.—Hauberk of rings set edgeways down to the knees; chausses of the same; helmet either conical with its apex somewhat rounded, or cylindrical (which first came into fashion in the latter part of this reign) with an aventaille to protect the face, cylindrical, with two horizontal slits for the eyes and mouth, and almost meeting behind. In later times the aventaille was of mail, and attached to the hood of the hauberk. The flat cylindrical helmet, with rather concave sides, of Geoffrey de Magnaville, in the Temple church, is of this reign. Horns of balain, i. e. whalebone, were sometimes annexed to the helmet. The chapel de fer was also worn. Armorial bearings on the shields were quite common.

John; from A. D. 1199 to 1216.—John is the first English king who appears in a surcoat, &c. worn over a hauberk of rings set edgeways. Surcoats, says Dr. Meyrick, seem to have originated with the Crusaders for the purpose of distinguishing the many different nations, and to throw a veil over the iron armour, so apt to heat excessively when exposed to the rays of the sun. They were at first without any mark of distinction, and either simply of one color or variegated. The haketon (quilted) under the surcoat was much esteemed under this reign. Specimens will be found in the monuments of Sir John D'Aubernon, in Stoke Dabernon church, Surrey, and John of Eltham, in Westminster abbey. King John appears in a cylindrical helmet, without any covering for the face; other instances have the nasal revived and cheek pieces. The effigy ascribed to Robert Curthose, in Gloucester cathedral, which cannot be prior to this reign, but looks much more like the work of the next, perhaps presents the earliest specimen of a coronet worn with armour, and of chaussons or breeches over the chausses. The spur of this period is fastened by a single leather, which passes through an aperture at the end of each shank and buckles on the top of the instep.

HENRY III. from A. D. 1216 to 1272.—Of the body-armour of this period the pourpoint originated in France. The threads seem to have been knotted outside, so as to form a kind of embroidery. It had sleeves, and occurs as early as the twelfth century. It was called also counterpoint. The military, temp. Henry III. and Edward I. are almost always depicted in it. A hauberk and chausses of it first appear on Henry's great seal It was probably adopted from the rusting of metal armour during service; and continued to be used from the middle of this to the conclusion of the next century. A hauberk with hood and chausses of flat contiguous rings appears, and is perhaps the latest example of such armour being worn. The heavy cavalry were covered with mail, the face and left hand excepted. The knights wore gamboised armour with surcoats; and the men at arms had poleyns or knee-pieces. The spearmen were protected merely by pectorals or tunicles of scales thrown over their tunics. The archers, both mounted and on foot, had hauberks of edge-ringed work with sleeves to the elbow, over which were placed leathern vests (called cuirenæ or cuireniæ, or the jacks or jackets which originated with the English), each vest being ornamented with four circular plates. There also occur ringed armour, the rings set edgeways all one way; whereas, in general, they were sewn in so that one row might lie to the left and another to the right alternately. The single chain mail was introduced in this reign from Asia, where it is still worn. The first great seal of Henry III. represents his helmet as with the visor or aperture for sight not in the aventaille but in the helmet itself, while the latter has merely perforations for the breath, and is therefore fixed at the lower part. His second seal exhibits him in a cylindrical helmet of a more perfect form, the aventaille, which contains both the before-mentioned conveniences, being apparently made to open and shut by means of rings and a clasp. Some horsemen appear with visors, consisting of a convex plate of steel, in which is a cross with perforations for the sight and punctures for the breath, which plate is tied upon the head. Scull-caps occur, but are not the latest representation; cylindrical helmets were common. During the latter part of this reign the shape of the helmet underwent a partial change, i. e. into a barrel form without the convex sides, or that of a truncated cone on the top of a cylinder; and as the apertures for the sight were horizontal, and pierced in the transverse part of a cross, which ornamented the front, it was probably occasioned by the Crusade. The change in the form of the helmet occasioned a corresponding one in that of the hood, which we find from that period taking the shape of the head. In the effigies of William Longespee, earl of Salisbury, the hood of mail covers the mouth. The flat coif worn in this reign was made of interlaced chain. The Saxon convex shield had been used as late as the reign of Stephen. The buckler succeeded in the thirteenth century, which, though circular, was flat or nearly so. The shield of the era is semi-cylindrical held by the hand in the cavity of the umbo. The lower part was called soute. The cointise or military scarf worn by knights (coming over one shoulder and under the arm of the other) was introduced in this reign. The alcato and collarium formed armour for the throat. The first was of Arabic origin, and derived from the Crusaders. The latter was probably part of the capuchon or hood, which covered the throat, made in three folds of cloth, or a collar of steel. The epauliere was a collection of plates placed upon the shoulder. Caparisons of horses of the long flowing kind first occur in 1219. Spurs with rowels appear, from the engraving of his seal, to have been contemporary with Henry III. but none occur on sepulchral monuments before the time of Edward II.

The *martel de fer*, a hammer with one point shelving, probably first used by Charles Martel of France, was common in this reign. The slingers preceded the army, and began the battle with their slings. They do not appear to have had any kind of armour, being generally formed of the poorest classes in society, and carried merely their sling, consisting of a thong fastened to the end of a staff, from which they threw a very large stone. The cross-bow men had a short sword, with at least a crooked-ended scabbard, called baselard. The epée à l'estoc, or stabbing sword, of French origin, was hung from the pommel of the saddle, and in the thirteenth century occurs the earliest instance where it accompanies the long sword. The German swords were extremely large, and large swords were now very fashionable. Flails, as weapons of war, and two handed swords, were in use in the German army as late as the time of Maximilian I. The lance and sword, though confined to freemen, were yet allowed to serfs on joining the army, though not on ordinary occasions. There were also in use the faussar, a small curved sword with its edge inside, of classical antiquity, or perhaps the same as the faulchion. The gæsum, which Dr. Meyrick thinks was a bladed weapon, not a spear; the haunet, a kind of lance; the guibet, a broad-bladed weapon, resembling a pointed spud, probably the same as the anelas; the anlace or anelas, a short knife with a very broad blade tapering to a point, and the besagüe, or cornuted short staff.

EDWARD THE FIRST; from 1272 to 1307.—The compactness and pliability of the chain-mail soon rendered its use almost universal. Clamucium, camisia, chemise de maile, corset o. mail, were several names of the shirt of mail. The men at arms had on their heads steel helmets, and were also clad in the wambais, i. e. a tunic wadded with wool, tow, or old cloth, and stitched longitudinally. The parallel lines are well defined in the knight in Hitchendon church, Bucks. Upon it they wore an iron shirt, that is, a garment, formed of iron rings interlaced, through which it was impossible for any bow to send an arrow so as to wound a man. The gambeson was also worn by itself, as well as under the armour; for knights appear in gamboised coats and chausses. The monument of Thomas de Berkeley, in Gough's Monuments. who died in 1243, contains the earliest specimen of the camail, attached by a cord to the

round scull-cap. It was the hood deprived of its coif, and was so named from its resemblance to a kind of tippet made of camel's hair, that was styled by the Greeks of Constantinople καμελαυκιον. Gloves with separate fingers, and covering the wrists, first appeared in this reign, and may be considered as the prototype of gauntlets.

Helmets.—A scull-cap, made in the form of the coif de mailles, was invented by Michael Scott, domestic astrologer to the emperor Frederick, and was called coiffe de fer, Cerveillera, and capitellum de Ferro. From the top of these scull-caps sometimes depended a bunch of horse-hair. The basinet, formed like the human head, was not a helmet, but worn under it. Sometimes visors were affixed to them, and then they served for helmets; others have an aventaille movable on pivots. In one monument (Meyrick, pl. xxiii. p. 161.) the Cerveillere is worn under the coif. This is probably the last monument of the rings set edgeways. The prototype of the conical helmets, introduced in this reign, is somewhat like the Phrygian bonnet, and has a square compartment, pierced with round holes opposite the face.

The *Testiere*, a head-piece, intended for a crest, fixed on the head of the horse between the ears, first occurs in this reign, and chanfrons to fit on the horses' heads, are first mentioned about the year 1295. Little bells were hung round the bridles of the Just players. Interlaced chain-mail was also used for horse armour. Of offensive arms the cultellus served both for knife and dagger; the faux were in the later eras called bills; the pile is the iron ferrule which covered the arrow; in a general view, a dart. The pile, often called pelote and pilote, also signified a club, and seems to have been the weapon used by the archers before they were enjoined to carry the mallet or maule; the croc is somewhat like the oncin, but more bent down in the form of a shepherd's crook; the dagger is worn with the sword as early as the time of Richard I.—*Swords.* The cross-bar in this reign is often made to descend on each side; the canipulus was a sort of dagger-knife; the estoc was a little sword, not that worn with the coutel or military knife; the scabbards were adorned with small shields of arms; the falchion is of this age; and the pole-axes are now of the form of a broad axe blade on the end of a pole, and a spike jutting out on the opposite side. The arms of the gallo-glasses or Irish infantry at this period consisted of shin-pieces, but of leather only (introduced by the Danes, and retained ever since); a helmet somewhat conical; a tunic with short sleeves; and a gorget, which just covers the shoulders. These last are either quilted, or merely plaids. For arms, some had a battle-axe, others a sword suspended by a belt.

Edward II. from 1307 to 1327.—Now commences the mixed mail and plate. The Florentine annals consider the year 1315 as remarkable for a new regulation in armour, by which every horseman who went to battle was to have his helmet, breast-plate, gauntlets, cuisses, and jambes, all of iron, a precaution which was taken on account of the disadvantages which their cavalry had suffered from their light armour at the battle of Catina. This usage did not find its way into general practice in Europe for at least ten years after. The armour at the close of this reign consists of a conical helmet, a surcoat of arms, complete mail with elbow-plates and knee-pieces of plate. The archers, mounted archers, and cross-bowmen, wore hauberks, and chausses of gamboised work, with surcoats over them, and conical helmets with visors affixed, each made of perforated plate. The gorget is called goccon at this period, and greaves of one plate were now introduced.

The *helmet* on the great seal of Edw. II. is of a cylindrical form with a grated or pierced aventaille and visor attached. The clasp which fastens this on the right side is very visible; and it is probable that on the other it was retained by hinges. The basinet at first was worn, as being lighter than a helmet, when the knight expected an attack, but wished to be prepared. When visors were made to them they, for a time, superseded the use of the helmet. The chapella de fer of this era is of a sugar-loaf form, with sides rather concave, and a ridged rim. Helmets round, with barred convex umbrils; heraldic crests and the cointise floating behind, and the barbiere, a head-piece whence a person wearing armour was said to be barbed, also occur. The offensive arms now in vogue were—the scimitar borrowed from the Turks; the thin-bladed dagger, called misericorde, because more easily inserted into the interstices of the armour; the falchion, a large sword; the war-knife or dagger; the mell, maule, or mallet of arms, and the godenda or godendac, a kind of pole-axe, with a spike at its end; the javelin, javrelot, gavielot, or gavelot, very like a dart, but with no feathers; the small mace, called mazara, by the French mazuete, by the English mazuelle; the bill or falcastrum; the gisarme was used in 1291; but it is recommended in sea-fights, that there be scythes firmly fixed to very long spears, from which originated the bills at this time; the catajæ, barbed darts or spears, each having a string at the end to recover it; and the mace, with four sides, armed with iron nails. The infantry were armed with spears, bills, gisarmes, and pole-axes.

The pieces of horse armour were the flanchière, which covered the flanks; the piciere, a breast-plate; the crouppiere, the covering which went over the horse's-tail, and hinder parts; gamboised housings, with armorial bearings on them; esquivalents or estivals, armour for the legs; chanfrons or champfreins, pieces of steel or leather to cover the horse's face; testieres, distinct from the chanfrons, and meaning the plate betwixt the ears, which was affixed to the chanfron by means of hinges. From the conquest to the time of Richard III., says Dr. Meyrick, the fashion was to ride with the toes down; after which period the heel was dropped and the toe raised.

Edward III. from 1327 to 1377.—Armour in this reign became exceedingly splendid, and occasioned many knights to be killed, purely for the sake of obtaining it. In all the figures, ex-

cept in the rare instance of cuirasses, the plate appears to be limited to the limbs, and that but partially; the shoulders and elbows have circular or other plates; some pieces down the arms; the legs, feet, and knees have plate; the body and throat are in pourpoint or gamboised work, or mail, as we loosely call it. Cuirasses also occur, and in 1362 an author speaks of double ones, the prototypes of the breast-plate with placcate, and such as were worn in the time of Henry V. The helmet is conical. In general not a surcoat, for that had been relinquished through its length entangling the wearer; but a cyclas, painted with the armorial bearings, covers the body-armour. The cyclas was succeeded by the jupon, gyppon, jupas, guipone, juppel, alguba, an exterior garment of Moorish origin, made of silk or velvet, charged with the armorial bearings. Sometimes it was laced down the side. Some light is thrown on the armour of this reign by the woman's gambeson; the body is like a pair of stays, to which is annexed a square petticoat, like a bell, stitched horizontally; the women wore it to regulate their shape. The origin of leaving off the single hauberk, and substituting plated armour, was the weight of the chain-mail with its accompanying garments; this was sometimes so great that the knights were suffocated in it. Most of the army during this reign consisted of stipendiary troops. Hobilers were in much request. Their arms were a horse, haqueton, or armour of plate, a basinet, iron gauntlets, a sword-knife or lance. There were also hobiler archers. This sort of troops lasted till the time of Henry VIII. The men at arms, a title which had been in former reigns sometimes conferred on the heavy-armed infantry, under this became of a mixed character, expressing the knights fighting both on horseback and on foot. They often performed their chief service while dismounted. Froissart calls them lances, from their being armed with this weapon; and this latter name became afterwards peculiarly appropriated to them. The armour of the cross-bowmen, at this period, consisted of scull-caps, plate on the legs and arms, and jackets with large pendant sleeves.

The king on his seal has a cylindrical helmet, with a knight's cap and crest upon it; but the usual form at this period is pointed. The basinets were formed into a sharp point, with a camail attached; and sometimes had an ornament on the peak resembling foliage. The coiffette of plate was a smaller or lighter kind of head-piece. The visored helmet usual for battle is conical, with a very singular ventaille, a wen-like protuberance, to cover the face. The herne-pan, or iron-pan, seems to have been a kind of scull-cap worn under the helmet. The cylindrical helmet appears not to have lasted much longer than this reign. The pavise was a large covering shield, convex and heater-shaped, protected with broad bands or edgings of iron, and embellished with arms. The shields were generally of wood, covered with a skin, called paune, pane, penne, and penna. A broad band of iron was frequently laid on near the edge. The belt by which the shield was suspended is called giga, guige, or guiggia.

The *offensive arms* most in vogue were (omitting those mentioned under preceding reigns) pole-axes, maces, masuelles, battle-axes (often suspended from the bow of the saddle, instead of the short sword, called estoc). *Short swords*, broad-bladed; some with texts of Scripture inscribed on them, a fashion which continued to the time of Henry VIII. clubs and shields, glaives, half-glaives or glavelots, gisarmes, and hand-gisarmes. The *saddle* of the horse-armour was like the back of an arm-chair, the cloth very splendid. The stirrups in the form of Gothic ellipses, and called *sautoures*; whence Du Cange supposes was derived the sautoir or saltier in heraldry. The caparison of silk, which was thrown over the poitral and croupiere of mail, was called cointise. In this reign prisoners of war surrendered by delivering up one of their gauntlets. It was the practice of the esquires to bind up the wounds of knights, when they were hurt. Men of rank, killed in battle, were carried off on their shields. The garter, as a badge of the famous order, seems in reality to have been a mere symbol of union; and it is not represented on monumental military effigies, till after the time of Edward III.

Richard II. from 1377 to 1399.—The *tabard* was a pure military garment, which seems to have become more general during this reign, and continued in fashion until the time of Henry VIII. It was a kind of tunic, which covered the front and back of the body, but was generally open at the sides, from under the shoulders downwards. It was emblazoned like the surcoat with armorial bearings. The long tabards were peculiar to the English, and sometimes called midlags, as they reached to the middle of the legs.

The *helmet* now most commonly used in battle is an ogee cone with a peaked penthouse umbril, and long neck flap behind. The invention on the edge of the basinet for covering the cord of the camail was not introduced till this reign. Tilting helmets vary, but they always appear very much to be matters of fancy.

The sword and dagger were attached by chains from the military girdle. The baston was a truncheon, or small club, used instead of the mace in regular fight. The glave consisted of a large blade at the end of a pole, and differed from the bill in having its edge on the outside curve.

Henry IV. from 1399 to 1413.—In this reign commences the armour of plate. The effigy of Sir John Lysle who died in 1407, on a brass plate in Thornton Church, Hampshire, and engraved in Gough's Monuments, is the general fashion of this and the next reign. No jupon is worn over it, nor any chain apron at the bottom of the tassets, but these are increased in number, and therefore extend lower. Not only are there the plates below the knee-caps, but corresponding ones are placed above. There is no mail at all used, but instead of the gussets to protect the arm-pits, circular plates are attached by points, which are tied at their centre. The basinet has nothing to protect the face, from which we may conclude that the uniber was put on and taken off at pleasure. To the elbow pieces, but on the inside, are attached large fan-like ornaments to protect the arm when straightened. The gir-

dle is not used, but, instead, a baudrick or ornamented belt, coming from the right hip to the left thigh diagonally, and to this is appended the sword, a curious circumstance, as it shows the shape of the baudrick at this time. Chirefeddin, a Persian living in 1401, describes the cavalry of Europe, all armed in steel, from head to feet, so that nothing can be seen but their eyes; their armour being fastened by a padlock, which, except they open their cuirass and helmet, cannot be taken off. Froissart somewhat sanctions this statement by observing, 'armed from foot to head,' because armour when put on was begun at the feet.

The improvements and alterations can best be decided by investigating matters in detail. The first approach towards making pauldrons (the single pieces which cover both the shoulder and upper arm) appears in the several over-lapping shoulder-plates or epaulieres, being extended greatly in front. The plate below the genouillere likewise occurs, but those worn below the knees are much larger than those worn by the Black Prince, and therefore they were necessarily fastened by a strap, which passed round the jamb. Tuilles, or plates over the thighs, now also appear for the first time. The lower ends of the juppons were made to terminate in various kinds of leaves, and the cloaks and sleeves are so peculiarly marked by indented edges, as to be distinctive characteristics of this and the next reign. The tilting helmet assumes a new form. The upper part is no longer a truncated cone, but is convex over the head, and the face-covering, anciently called the ventail, is made to project considerably above the ocularium, or aperture for the eyes. On the top of the helmet is a crest formed of feathers, not a plume, which did not come in till the next reign. The war-helmet, so prevalent soon after this reign, is higher in the apex, and shows the intermediate form of the uniber (that which contains both beaver and visor), between the conical one of the early part of this reign, and the convex one of the next. Collars of knighthood were introduced in this reign: no earlier instance appears. Collars of SS. were not taken from St. Simplicius but more probably from Souveraine, the motto of Henry while earl of Derby, and seemingly prophetic. Footed stirrups occur in this reign; the solerets being omitted. Bridles with bells, and necks of horses thus ornamented were now also introduced from Asia. The offensive arms were the Besague, a large martel, seemingly more used for throwing than for close combat; the harsegaye, a kind of demi-lance, the same as arze-gaye, and the favorite weapon of Greek troops at this time, and evidently of Asiatic origin.

Henry V. from 1413 to 1422.—Black armour was used in this reign, not only for battle but for mourning. According to some illuminations the archer of this period has a cuirass or hauberk of chain-mail, with a salade on his head, which was a kind of basinet, but projecting much behind, and a sabre suspended at his side. According to Dr. Meyrick, there appears now to have been two kinds of body-armour contemporary; one, a flexible cuirass, made of overlapping bands of steel, and of the fashion of a pair of stays; the other a globose breast-plate. The latter was introduced from the Low Countries, and first occurs in paintings of the earls of Holland, which appear to have been done at this time, and are now at Utrecht. The first steps towards ornamenting the breast-plate, viz. curved lines ending in scrolls, appear in this reign; and the helmet presents sometimes a wreath on the basinet and an inscription on the fore-head plate.

The *coutel* is a weapon of this period, having a sharp edge on one side, and the point forming somewhat like a right angle. It has a handle of stag's horn, below which is a fox or squirrel, or whatever may be the cognizance of the owner, and was generally worn behind, just over the right hip. Swords for tournaments were larger and heavier than those for war. A pole-axe, or staff, with a cheese-knife or crescent blade, was carried by commanders, without any variation, from this reign to that of Edward IV. The badelaire, or baudelaire, was a little portative knife. Two-handed swords with flaming blades, though never common, first occur in this reign. They were probably intended more for state than war, though they certainly have been used in battle.

The *manefaire*, or protection for the horse's neck, first appears on the great seal of Henry V. The chanfron or champfrein took a different form from that of the last reign, and not only wraps round the nose, but has cheek pieces. It however reaches only to just above the nostrils. On the top of the chanfron, or rather on that part of it which now acquired the exclusive appellation of testiere, are placed the fore-legs of the lion, the king's crest. On all preceding occasions the crest had been fixed on the head-stall. The bow of the saddle is protected by a plate of steel reaching below the knees.

Henry VI. from 1422 to 1461.—The armour is now completely of plate. The great distinction appears to be tuilles or flaps, appended by straps to the taces, and hanging over the upper parts of the thighs; the pouldrons, elevated or turned up at the edges, like the standing collar of a coat, so as to form the prototypes of pass guards; and several circular elbow-pieces, regulated over each other, the largest reaching to the upper arm. The monument of John duke of Somerset, who died in 1444, affords a specimen of splendid armour. Dr. Meyrick has placed in his hand one of those pole-axes so generally used at this period, and the distinction of commanders; besides which he has a very long sword, and large rowelled spurs. After 1458 wearing the sword in front, and cropped hair, were introduced; also several fantastic Lombard fashions in armour and military attire. Maces, feathered javelins, pole-axes, glaives, and spears, are of great variety. Splendid tents, both circular and oblong, occur. The knights invariably ride with long stirrups, and their toes pointed down, a fashion which, as before observed, lasted from the Conquest to the time of Henry VII. The necks of the spurs, too, are uncommonly long.

Tilting helmets, surmounted by crests, appear under the heads of sepulchral effigies. We find also the cappeline, a scull-cap, some visored, called steel hats, with an ornamental apex, like a fleur-de-lis, and a long slit for sight, above the

projecting brims; the salade, called by the Italians celata. This, it has been supposed, was so called from its concealing the head, whereas the reverse was precisely the case; for it only covered the upper part of the head. Its origin therefore is probably from the German word schale. Flattened helmets were introduced about this period, and continued to be much worn in the next reign, and occasionally until the close of that of Henry VII. The tilting helmet is without a movable visor to meet the beavor. The shield is now made not only to bend forwards at top, but a smaller piece is put at the bottom to prevent the lance, when struck against it, from slipping down and so injuring the thigh. Pavises were shields of the heater form, and convex, sufficient to cover a man inclining, who held it before a cross-bow man. They were called paniers, on account of their construction, which was this: the interior was formed of osiers, over which was placed a cover of aspin-wood, or the black poplar, the wood of which is white, and very light: sometimes indeed this exterior surface was winding, and then the osiers were more closely interwoven. The talevas or talvan was a pavise of an oblong form. There were also square shields. Knights are also mentioned with oval shields or targets, and it is probably from this period that we should date the introduction of the target, instead of a shield, borne by an esquire of the champion at coronations.

The *coustille* or *cultellus* served the purpose of a knife and dagger. The *voulge* or *bouge* was a large two-handed sword with a leaf-shaped point, and there is some reason to conclude that it was the same as the gisarme. There was certainly a two-handed sword, but not quite so early as this period; and this sword was used in boar-hunting. Two voulges are in the armoury of Llewelyn Meyrick, esq. having blades much wider than those of a sword, which swells a little in the middle of each side, and have the leaves as an ornamental termination at the bottom. Swords with flat circular guards occur, and falchions exactly like scythe-blades. The flagel or flail, called by the French flagau or fleau, from the Lat. flagellum, was used at this time, as well as in that of Henry III. and his son. Spears ornamented in a spiral manner occur. The espiet, espiot, espieu, or espiton, was a kind of small glaive. It seems to have been the origin of the kind of sword called the espadon, and was probably a sort of sword-blade, fixed at the end of a short staff. The lance was a word sometimes used at this period to signify a banner. The javelin was used in this reign: the kind called couffort was a sort of demi-glaive. Axes with a blade, resembling some of the old halberds, also occur.

The *chanfron* of the earl of Warwick's horse is without cheek-pieces, but longer on that account; and just where it terminates above the nostrils is a kind of proboscis rising upwards. This proboscis, which, after being turned up as high as between the eyes, was then bent forward, was at the close of this reign superseded by the invention of a spike, made to rise at once from between the eyes, a fashion which continued as long as that species of armour lasted, namely till the end of Elizabeth's reign.

Edward IV. from 1461 to 1483.—The armour of this period, which seems to have passed from Italy and Germany through France to England, has the peculiarities of very globular protuberant breast-plates; tuilles, only one for each thigh, very large, of sharp angular form; and immense elbow-plates; but there are instances where none of these appear. The men-at-arms are in complete armour, but instead of a helmet wear a capelline, the crown of which is convex, and the rim cut into angles, before, behind, and at the sides. Swords and bucklers used by archers commence with this reign. Brigandines were now first worn by the troops called Brigands, after whom they were named. The brigandine jacket was composed of square iron plates, quilted within linen, and used by the archers from the latter part of the reign of Henry VI. to that of queen Elizabeth.

The *morion* now first appears. The men-at-arms wore feathers in their helmets; and scrolls, supposed in imitation of torn cointises, now occur, instead of the latter, on the helmet. The shields used by the cavalry at this period were continued with scarcely any alteration to the middle of the reign of Henry VII. One of these made of wood, covered with a skin and lined with leather, having on it a hook and rings for the guige, is in Mr. L. Meyrick's armoury. It is curved outwards for the convenience of the bridle-arm, has three ridges down its front, and is wider at bottom than at top. The bouche, or mouth for the lance to pass through, is at the left upper corner.

The lances of the cavalry were exceedingly long. The lances d'armes were those used by the men-at-arms in battle, in contradistinction to those for the tournament. Coronels, pointless lances. 'Speris garneste, that is cornall, vamplate, and grapers, a.. of acise.' i. e. spears garnished or furnished. The halbert, if the weapon so named was really a halberd and not a pole-axe, is now frequently mentioned, though its name had long been known to the nations of the North. The waroquian was a kind of strong heavy quarter-staff, carried by the poorest class, who followed the camp. The voulge or vouges were staves, at one end of which was a long blade, pointed, but made to cut, and broad in the middle, resembling glaives. The sword-blade anterior to the middle of the reign of Henry VIII. tapered from the guard, gradually to a point. In the time of Edward IV. they were nearly flat, but in earlier times a section of them would have presented the face of a lozenge. In that of Henry VII. they had a ridge on each side, and at the commencement of that of Henry VIII. instead of the ridge were thickened towards the point. In the army were men called coustillers or cutlers, who were armed with long knives. Large two-handed swords were used at this period, and until the close of the reign of Henry VIII.; also rebated swords for tilting and exercise; from the French rebattre. Rebating the points of swords gave origin to the buttons at the end of fencing foils. Spears and swords in this state were called epées gra-

cieuses, glaives courtois, armes courtoises. The gayne-paine was a sword used in tournaments.

Behind the saddle on the middle of the crupper of the horse, on the great seal of Edward IV. is a round ball, apparently for ornament, but intended to enable the tilter to recover his seat and not be pushed down behind by the lance. This invention appears to have been what was called a rere-brake; as such a thing is stated in one of the Paston MSS. as requisite for a tilter, and is described as made of, or accompanied with, a 'roule of leather' well stuffed. At a later period, a large bell was substituted for this at the tournament. The chanfron with a spike projecting from it was adopted at least in 1467; probably this is the earliest date. It succeeded the proboscis, and was general from the time of Henry VII.

Edward V. anno 1483.—The armour on one arm differs greatly from that of the other. The figure of a man-at-arms has a shield of a singular shape (viz. a long quadrant or quarter of an oval) with the word 'anime' written upon it; and the guige or strap unbuckled. One elbow-piece is very large, and projects in a sharp point; the other is formed by a small circular plate, with a spiked boss in the centre. One shoulder-piece, or pauldron, has a high turned-up ridge, the other not. The cuff of the gauntlet projects in a sharp top.

Richard III. from 1483 to 1486.—No higher degree of perfection was ever attained in armour than during this reign. The outline of the suit was most elegant, the workmanship elaborate, and the choice of ornaments full of taste. The monumental effigies in brass of this period fully prove the assertion. That of Sir Thomas Peyton, of this reign, which is preserved and engraved by Dr. Meyrick, is armed with all pieces, except his helmet, on which account a visored salade of this date is added. This does not protect the face, but when worn the lower part was supplied by the hausse-col, or gorget which was so formed on purpose. The breast of this armour is globular, and furnished with a demi-placard. The pauldrons are beautifully ribbed, and on the right one is placed the moton, which answers the purpose of a palette; but the ornaments at the elbows are superb beyond comparison. The gauntlets have overlapping plates, instead of fingers, and two fine tuilles hang pendent from the lowest trace. The sword belt is so disposed, that the ponderous sword may keep in front, while a dagger is attached to the right hip.

Henry VII. from 1486 to 1509.—The armour of the king is quite novel. It consists of an ornamented cuirass in the form of a pair of stays, which terminates at the hip in a petticoat down to the knees; all of which are thus described by Dr. Meyrick: 'The part which covers the body has a very cylindrical appearance, notwithstanding the convexity of the breast-plate, but is engraved all over, together with the large puckered plates of steel, which cover each thigh to the knee, and continue behind, except where hollowed out for the saddle. These plates are its curiosity, being in imitation of cloth, and called lamboys. The toes of the sollerets are almost square; and a little slit is made in the heel to admit the spur, a mode which continued throughout the next reign.' In this time occurs the beautiful fluted armour which had its origin in Germany; and Jazarine jackets of velvet, &c. ornamented with brass studs, are of this era.—Cloaks were worn with armour, now and from the time of Edward II. to that of Charles I. The archers, in the illuminations of this period, are clad in a shirt of chain-mail, with great wide sleeves. The English army at this time consisted of men-at-arms, with their custrels also mounted, demi-lancers, and horse-archers; and the infantry of bowmen, billmen, and halberdiers. This last kind of troops made their appearance during this reign. The cloathing of the army was white, with a red cross upon it. The cod-piece, or French baguette, came up in this reign. It originated in the flap, which became at first convex and then protuberant. Chain-mail occasionally occurs instead of tuilles; and, as socks, annexed to the sollerets. The great change in armour during this reign was in the shape of the latter. It became square at the toe, being previously perfectly round. The blade of the lance was very small. The battle-axe was at this time considered to be a royal weapon. We find horses with long feathers placed between their ears, and tassels appendent to the stirrups. Abroad, the caparison of a horse occurs in an illumination covered with music, the notes of which are made of fleurs-de-lis, on five lines.

Henry VIII. from 1509 to 1547.—During the latter part of the reign of Henry VII. and the early part of this, whether the armour was fluted or plain, the breast-plate had a globose form, and was terminated at top by a straight line, composed of a round piece of nearly an inch diameter in the centre, which was intended to prevent the thrust of a lance driving the point into the throat. Similar pieces were also on the gussets of plate, which turning on a nail moved at the upper end on the slit of an almaine rivet, to allow the wearer the more readily to close his arms, the straps of the back plate bringing them back to their place, when the arms withdrew. About the middle of this reign, the breast, although globose, took an edged form down the centre, which was called the tapull, an old fashion revived. The most striking features of the armour of this reign are its being embroidered or fluted, and a large arched aperture of the tassets, over the pudenda. The globose breast-plate, but lightly edged in the centre, was succeeded by one, where the edge was more raised, and made to project in the centre of the breast, so as to turn a weapon. This projection on the breast was afterwards removed from the centre lower down. It has pass-guards, and a large cod-piece. A great deal of the armour of this period has a coat of arms of the place where they were made, stamped on its various pieces. Sometimes the knights had their arms and crest engraved on the upper part of their breast-plates, which, from the time of Edward IV. to the close of the reign of Elizabeth, were furnished with gussets of plate, just under the arms, so contrived as to give way to their motions. The cuisses from the latter part of Henry the Seventh's time to this period had a similar contrivance on their

tops to give way with the motions of the legs. The allecret was a light armour for infantry, and consisted of armour for the breast, back, abdomen, thighs, arms, and chain-mail gorgets for the neck. Raised armour, now used, was the prototype of the embossed. The ground was nearly black, and all the foliage raised about the tenth of an inch, and made to shine. The pauldrons, elbow-pieces, and knee-pieces, have raised lions' heads on them. Stuffed arming doublets, or jackets reaching down to the middle of the thighs, and with sleeves of chain-mail, was a fashion of this era. White armour universally means polished steel.

Ponderous tilting helmets occur in this reign. Convex roundels are of this age; in one specimen, by unscrewing the spike, and taking off the raised foliage, an inscription is seen.

Henry VIII. repeatedly fought at barriers with two handed swords carried on the shoulders, and the battle-axe. Some of state at this period were very superb. The art of inlaying weapons with gold was now borrowed from the Asiatics, called damasquinée, and introduced by Benvenuto Cellini. In this reign also the fencers became an incorporated body. A very curious weapon called a sword-breaker, was now used; it had a hilt, pommel, and guard; the blade was made in the fashion of a scimitar, the edge being deeply serrated. It contained a spring, by means of which the antagonist's sword was held fast, as soon as it came within the teeth. By moving the hand a little, the blade of the antagonist's weapon was broken, and he was either cut or stabbed with the sword-breaker at option. L. Meyrick, esq. has one of them in his collection. The mell, maule, or mallet, used by the archers of this time, was made of lead, hooped round the ends with iron. In this reign was introduced a weapon called the pertuisan, or partisan. The etymology of the word has been much controverted, but seems to lie (says Dr. Meyrick) between the Latin pertica and the German bart, an axe. Its blade was much longer than that of the pike, and much like that of the spontoon, but not so long nor quite so broad. It was found more serviceable than the pike in trenches, mounting breaches, and in taking or defending lodgments. It was used as late as the time of William III. but its blade had become broader, and is still carried by the yeomen of the guard. Spontoons, morning-stars, battle-axes, and pole-axes, some with four cross pieces, were also weapons of this reign.

Beautiful and fanciful chanfrons, formed into heads of griffins, and beat out of the solid steel in a wonderful manner, were now in vogue. The horse also had a manefaire, and round his neck a string of large bells, an Asiatic fashion. Just by the horse's shoulder the poitral was beat into a convex form. When a knight was armed for the jouste, called a haute bardè, it meant the bardè or armour for the horse, rising so high as to protect the rider up to the abdomen. The term bardè was sometimes applied to the poitrinal, or breast-plate of the horse, but, according to Richelet, it signified the whole armour for the horse. The tilt and sockettes were pieces of steel fixed to the saddle for protection of the thighs. The stirrup had a bar on front to prevent the feet slipping forwards. The port was either fixed to the saddle or the stirrup, and was made to carry the lance, when held upright. The base was the drapery thrown over the horse, and sometimes drawn tight over the armour which he wore.

Edward VI. from 1547 to 1553.—The chief distinction of the armour of this period consisted in the breast. The projection on the tapull was lowered to the bottom of it; i. e. the waist was lengthened, and it was called long-waisted, or pease-cod-bellied, from its resemblance to a pea-shell. Trunk hose made the upper part of cuisses, while the tassets hung over them. Brigandines (of which under the reign of Mary) now in use, were called, from their form, millers' coats. Dr. Meyrick thinks that the armet petit, or grand, was a helmet that might form either a close or open casque, according to the wish of the wearer. The beaver of the helmet of a man-at-arms, and demi-lancer, was made of three parts, which move over each other, and when covering the face, are held by little catches. This is probably the great and little armet, and was the kind of helmet which Shakspeare had before him, when in the play of Richard III. he says of this monarch, 'Had you seen him with his beaver up,' because he there alludes to his being prepared for war. On the top plate a horizontal bar, which meeting the umbril, when up, formed the visor. This beaver, however, was made to take off the helmet, which thus became an open one. The helmet is also furnished with two oreillets, attached by hinges, and will meet over the chin-piece of the conjoined bars. The jambs, peculiar to this period, have joints above the ancles, which greatly assist the motion of the feet, and consist of several overlapping plates. Breast-plates now became of great weight and thickness, to resist pistol balls; and the cuisses are buckled on to them. The targets have a pistol instead of a spike, at the boss. At this time the mace was exchanged for the pistol. Holy-water sprinkles were staves with large cylindrical heads, with spikes, and a spear pointed at the end. They are generally ascribed to the Danes. Rancons were a kind of bills. The baton of the duke of Alva is covered with the result of military calculations. The mace is of the common chocolate-mill form.

Mary; from 1553 to 1558.—No alteration, except that the breast-plates are not so long. Fire arms now became common, but there was no strong desire to introduce them, the long-bow being deemed equal. The men-at-arms consisted of the nobility and knights; and about this time the term was changed from men-at-arms, hitherto given to the heavy cavalry, to spears or spearmen, and lances or lancers. The sallets were head-pieces which resembled, in some respects, the morion, and in others the pot or iron-hat. Steel feet-caps were used instead of sollerets. The black-bill, so called from the blades being blacked, instead of being kept bright; and the military fork, a weapon exactly like the common pitch-fork, were in use in this reign. Steel saddles were those whose burrs or bows and cantles were covered with steel.

Elizabeth; from 1558 to 1603.—The body-armour seldom comes lower now than just beneath the hips. Complete jousting suits do indeed appear, but the combating knights are without any armour on the legs and thighs. The embossed armour is exceedingly rich. Heavy armour, owing to the thickness of the breast-plates, being bullet proof, was introduced towards the latter part of this reign. Hussars, with scimitars, &c. taken from the Hungarians and Poles, commenced in this reign. The buckler then had a spike in the centre, and was sold by haberdashers. A baton used to hang suspended from the right breasts of knights in tournaments In this century the rapier and dagger were usually worn by the side of each other, and the fight with both together was deemed a gallant thing. Representations of negroes' heads, arising from intercourse with America and the West Indies, were now introduced, as pommels and ornaments of swords. The sword and buckler ended with this reign. The rapier or tuck was introduced from France by Rowland York about 1587, and was worn in dances. The term proking spit seems to mean a long Spanish rapier, in opposition to the contemporary broad Scotch sword. The whin-yard was a sword or hanger. Horse armour was disused in Germany during this reign. Perhaps the latest instance of chanfrons occurs in the time of Charles I.

The phrase of a 'hog in armour' seems to have arisen (says Dr. Meyrick) from that animal, or parts of it, having been thus distinguished during this century, when put on the table. Thus, in the list of dishes for the coronation dinner of Queen Elizabeth, are 'sheeldes of brawne in armour.'

James I. from 1603 to 1625.—Thick breast-plates, bullet proof, characterise this reign. In the latter part of it the jambs or steel coverings for the legs were almost wholly laid aside. The heavy cavalry, then called pistoliers, wore suits which ended at the knees; and this fashion continued during the following reign. About the year 1600 dragoons appeared. During this reign, and that of Elizabeth, the pauldrons were often attached to the armour by straps which came from beneath the gorget, while in the time of Charles I. they were placed above it. In the reign of Henry VIII. the pauldrons had in them little holes, which slipped on upright pins fixed on hinges placed on the gorget, and with spring catches in them to hold these shoulder-pieces fast. The splints within the elbows continued from the time of Henry VIII. to this reign inclusive. A fine expanding garde de reine (a concave skirt of plates over the posteriors) also distinguishes this period.

Charles I. from 1625 to 1648.—No armour now reaches below the knees. The cuirassiers had gorgets, cuirasses, cutases, culets, (mere names of the garde de reine) pouldrons, vambraces, a left hand gauntlet (probably of leather for the bridle-arm), taces, much shorter than those of the infantry, being, indeed, the upper part of the cuisse loosened, cuisses and casques. The hargobusiers or carbines had gorgets, cuirasses, cutases, pouldrons, vambraces, and a light head-piece, wide sighted, with beavers to let down upon bars of iron. The dragoons (or footmen on horseback) an open head-piece with cheeks, and a buff coat with deep skirts. The pikemen combe-caps, cuirasses, gorgets, taches down to the mid-thighs. The Rondell or Rondache (a target), which had been revived by Prince Maurice, was disused in the early part of this reign. The combed head-piece was a morion with a high ridge on its top; the combe-caps had a ridge hanging over them from the front to the rear, seemingly the same. A curious head-piece occurs with neck flaps, and a bar passing through the umbril to guard the face from a cross cut. The garde de reine was relinquished soon after 1650, or rather became so short, as to be scarce distinguishable.

Cromwell; from 1649 to 1660.—Helmets, and cuirasses, without garde-de-reines, were worn over a good buff coat by the cavalry, now denominated cuirassiers. The wearing of armour to the knees had continued to this time, because the cavalry did not till then cease to use the lance. Elbow-pieces of plate, at least in some instances, seem to accompany the cuirass. Immense gambado boots guard the legs. Gorgets of a large size were often worn alone, a practice which seems to have been introduced by naval officers Cromwell's troops had generally basket-hilted swords very close resembling the Scotch, whether the blade was curved or straight, and large cutting swords. The thumbring seems to have been first put upon sword hilts at the close of Elizabeth's reign, and to have originated in Germany. The basket hilt may have arisen in the time of James I. when the gauntlet began to be disused, and was derived from the ornamented shell-guards previously in fashion. I conceive, says Dr. Meyrick, that the broader the Scotch blade the more ancient it is.

Charles II. from 1660 to 1685.—At this time officers wore no other armour than a large gorget, which nearly served the purpose of a breast-plate, a circumstance commemorated in the diminutive ornament in the present day. Silk armour, proof against bullet or steel, which rendered the figure very ridiculous, was in vogue. An attempt to connect the helmet and hat in the same head-covering was made by a perforated steel-cap, put in the hat of the horse-soldier. Large gambado boots and spurs, to prevent the effects of pressure in a charge, were also worn.

Daggers of this reign in remembrance of the death of Sir Edmundbury Godfrey who was regarded a martyr for the Protestant cause, were inscribed 'Godfrey' and 'Memento Godfrey.' Another weapon was a pocket flail, the handle resembling a farrier's blood-stick; the flail was joined to the end by a strong nervous ligature, and was made of lignum vitæ. It was an accompaniment of the silk armour. Upright pieces, called burrs, were placed on the saddle, in front of the thighs.

Dr. Meyrick sums up with the following remark: 'The ancient weapons of the infantry had been principally the spear, the bill, the glaive, and the gisarme. The introduction of the bayonet occasioned these in their turn to fall into disuse, and rendered defensive armour unnecessary, as when musket proof it was too heavy for the convenience of the wearer. The lance has, however,

been revived in the European armies. Should this become general, the cuirass, if not more, must again be brought into use, so dependent are defensive on offensive arms.'

The connexion of this subject with the wars of mankind down to a very late period; the light it occasionally throws upon questions of mythology, poetry, and general history, upon the religious rites of most nations; the rise and progress of the arts; and even upon questions of jurisprudence and civil polity may excuse the length to which we have pursued its details. 'Our greatest poets,' it is well observed in Dr. Meyrick's preface, 'have felt the necessity of some extensive acquaintance with these topics, and have been aided beyond calculation in some of their grander scenes, by the splendid machinery of ancient armour. How would the high debates, the terrific array, the giant steps of Milton's Pandemonium, stripped of their armour, be denuded of their impression!' He instances the 'superior fiend:'

> With Atlantæan shoulders fit to bear
> The weight of mightiest monarchies.

The battle scene in heaven, &c. from Shakspeare:

> O majesty!
> When thou dost pinch thy bearer, thou dost sit
> Like a rich armour worn in heat of day,
> That scalds with safety.

And the fine moral lesson:

> What stronger breast-plate than a heart untainted!
> Thrice is he armed that hath his quarrel just,
> And he but naked, though locked up in steel,
> Whose conscience with injustice is corrupted.

Armour, Coat, is the escutcheon of any person, or family, with its several charges, and other furniture; as mantling, crest, supporters, motto, &c.—Thus we say a gentleman of coat-armour; meaning one who bears arms. See Heraldry.

Armourer of a ship, a person whose office it is to take care that the arms be in a condition fit for service.

Armourers, in Roman antiquity, were disposed in certain places in the empire, it being forbidden to sell, or buy, or make arms elsewhere. They were exempted from all offices and taxes, and received a salary from the public. When once they had taken the employment, neither they nor their children were allowed to quit it. To prevent this they had a kind of mark impressed upon the arm, whereby they might be known. If any of them fled or secreted their ware, the rest were obliged to answer for him; on account of which the effects of such as died without a legal heir went to the college. There were placed near the frontiers fifteen armamentaries in the eastern empire, and nineteen in the western.

Armourer's Company, one of the companies of the city of London, incorporated by Henry VI. The arms are argent on a chevron gules, a gauntlet between four swords in saltier on a chief sable, a buckler argent, charged with a cross gules betwixt two helmets of the first. The crest is a man demi-armed at all points surmounting a torce and helmet. The motto, 'Make all sure.'

Arms of Parade, or Courtesy, were those used in the ancient justs and tournaments; which were commonly unshod lances, swords without edge or point, wooden swords and even canes.

Arms, pass of, was a kind of combat in use among the ancient cavaliers.

Arms, in falconry, denote the legs of a hawk, from the thigh to the foot. See Falconry.

Arms, in heraldry, are used for marks of dignity and honor, regularly composed of certain figures and colors, given or authorised by sovereigns, and borne in banners, shields, coats, &c. for the distinction of persons, families, and states, and passing by descent to posterity. They are called arms because they are borne principally on the buckler, cuirass, banners, and other apparatus of war. They are also called coats of arms, coat-armour, &c. because anciently embroidered on fur coats, &c. See Heraldry. Some will have the name to have been first occasioned by the ancient knights, who, in their justs and tournaments, bore certain marks, which were frequently their mistress's favors, in their armour, i. e. their helm or shield, to distinguish them from each other. Arms at present follow the nature of titles, which being made hereditary, these are also become so, being the several marks for distinguishing families and kindreds, as names are of persons and individuals. They are distinguished by various epithets, such as,

Arms, Assumptive, are such as a man has a right to assume of himself, in virtue of some gallant action. As if a man who is no gentleman of blood, nor has coat armour, takes a gentleman, lord, or prince, prisoner, in any lawful war; he becomes entitled to bear the shield of such prisoner, and enjoy it to him and his heirs. The foundation hereof is that principle in military law, that the dominion of things taken in lawful war passes to the conqueror.

Arms, Canting, are those wherein the figures bear an allusion to the name of the family. Such are those of the family of Prado in Spain, whose field is a meadow. Most authors hold these the most noble and regular, as is shown by an infinity of instances produced by father Varenne and Menetrier. They are much debased, when they come to partake of the rebus.

Arms, Charged, are such as retain their ancient integrity and value, with the addition of some new honorable charge or bearing, in consideration of some noble action.

Arms, False, or Irregular, are those wherein there is something contrary to the established rules of heraldry; as when metal is put on metal, or color on color, &c. The laws of arms, with the cognizance of offences committed therein, belong, in Britain, to the earl-marshal and college of arms.

Arms, Full, or Entire, are such as retain their primitive purity, integrity, or value; without any alterations, abatements, or the like. It is a rule, that the simpler and less diversified the arms, the more noble and ancient they are. For this reason Garcias Ximenes, first king of Navarre, and his successors for several ages, bore only gules, without any figure at all. The arms of all younger sons, and junior families, of princes of the blood, are not pure and full; but distinguished and diminished by proper differences, &c.

Arms of Alliance are those which families or private persons join to their own, to denote the alliances which they have contracted by marriage.

Arms of Community are those of bishoprics, cities, universities, and other bodies corporate.

Arms of Concession, or augmentation of honor, are either entire arms, or else one or more figures given by princes as a reward for some extraordinary service.

Arms of Dominion are those which emperors, kings, and sovereign states bear, being annexed to the territories which they possess. Thus the three lions are the arms of England; the fleurs-de-lis those of France, &c.

Arms of Patronage, are those which governors of provinces, lords of manors, &c. add to their family arms, in token of their peculiar superiority and jurisdiction.

Arms of Pretension are those of such kingdoms or territories to which a prince or lord has some claim, and which he adds to his own, though the kingdoms or territories be possessed by a foreign prince or other lord. Thus the kings of England have quartered the arms of France with their own, ever since the claim of Edward III. to that kingdom in 1330.

Arms of Succession are assumed by those who inherit estates, manors, &c. by will, entail, or donation, and which they either impale or quarter with their own arms.

Arms, in law, are extended to any thing which a man takes in his hand in his wrath, to cast at, or strike, another. By the common law it is an offence for persons to go or ride armed with dangerous weapons; but gentlemen may wear common armour, according to their quality, &c. The king may prohibit force of arms, and punish offenders according to law; and herein every subject is bound to be aiding. Stat. 7 Edw. I. None shall come with force and arms before the king's justices, nor ride armed in an affray of the peace, on pain to forfeit their armour, and to suffer imprisonment, &c. 2 Ed. III. c. 3. The importation of arms and ammunition are prohibited by 1 Jac. II. c. 8. and by 1 W. and M. stat. ii. c. 2. Protestant subjects may have arms for their defence. So likewise arms, &c. shipped after prohibition are forfeited by 29 G. I. c. 16. sec. 2. Arms of offence in use among us at present are the sword, pistol, musket, bayonet, pike, &c.

Arms, in natural history, denote the natural weapons, or parts of defence, of beasts; as claws, teeth, tusks of elephants, beaks of birds, &c.

ARMSTRONG (John), M.D. an eminent physician, poet, and miscellaneous writer, was born in Castleton parish, Roxburghshire, where his father and brother were ministers, completed his education in the university of Edinburgh; where he took his degree in physic, Feb. 4, 1732, and published his thesis, as the forms of that university require, De Tabe Purulentâ. In 1735 he published a little humorous pamphlet in 8vo., entitled An Essay for abridging the Study of Physic; to which is added a Dialogue betwixt Hygeia, Mercury, and Pluto, relating to the practice of physic, as it is managed by a certain illustrious society. As also an epistle, from Usbek the Persian to Joshua Ward, esq. This piece contains much drollery in the dialogue. He next published the Economy of Love; a poem which has much merit, but too strongly tinctured with the licentiousness of Ovid. His maturer judgment expunged many of the luxuriances of youthful fancy, in an edition revised and corrected by the author in 1768. It appears that Mr. Millar paid fifty guineas for the copy right of this poem, which was intended as a burlesque on some didactic writers. In 1760 he was appointed physician to the army in Germany, where, in 1761, he wrote a poem called Day, an epistle to John Wilkes, esq. of Aylesbury. His principal work is The Art of Preserving Health, which appeared in 1744; besides which he wrote a Synopsis of the History and Cure of the Venereal Disease, 1737; Benevolence, a poem, 1751; Taste, a poetic Epistle to a young Critic, 1753; Sketches, or Essays on various Subjects; A short Ramble through some Parts of France and Italy. He died in September, 1779; and, to the surprise of his friends, left more than £3000 saved out of a very moderate income, arising principally from his half-pay.

Armstrong (Sir Thomas), an English gentleman, whose activity in behalf of the king during the rebellion, caused Cromwell to imprison him and threaten his life. He was an open enemy to popery, and entered very warmly into the duke of Monmouth's service. An insurrection having been planned by the country party, soon after the new sheriffs were imposed on the city of London by the influence of the court, Sir Thomas Armstrong went with the duke of Monmouth to inspect the king's guards, for the purpose of judging whether they might hazard an attack upon them in the intended insurrection; after which, finding himself obnoxious to the court, he hastily left the kingdom, and was outlawed. He was seized abroad, sent to London, and condemned and executed without a trial in 1684.

ARMY, accurately defined, is a given number of soldiers, consisting of horse and foot, completely armed, and provided with artillery, ammunition, provisions, &c. under the command of one general, having lieutenant-generals, major-generals, brigadiers, and other officers under him. An army is composed of squadrons and battalions; and is usually divided into three corps, and formed into three lines: the first line is called the van-guard, the second the main-body, and the third the rear-guard, or body of reserve. The middle of each line is possessed by the foot; the cavalry form the right and left

wing of each line; and sometimes they place squadrons of horse in the intervals between the battalions.

Armies in general are distinguished by the following appellations: a covering army; a blockading army; an army of observation; an army of reserve; a flying army.

An army is said to *cover* a place when it lies encamped or in cantonments, for the protection of the different passes which lead to a principal object of defence.

An army is said to *blockade* a place, when being well provided with heavy ordnance and other warlike means, it is employed to invest a town for the direct and immediate purpose of reducing it by assault or famine.

An army of observation is so called, because by its advanced positions and desultory movements, it is constantly employed in watching the enemy.

An army of reserve may not improperly be called a general depôt of troops for effective service. In cases of emergency the whole or detached parts of an army of reserve are generally employed to recover a lost day, or to secure a victory. It is likewise sometimes made use of for the double purpose of secretly increasing the number of active forces, and rendering the aid necessary according to the exigency of the moment, and of deceiving the enemy with respect to its real strength.

A flying army is a strong body of horse and foot, commanded, for the most part, by a lieutenant-general, which is always in motion both to cover its own garrisons, and to keep the enemy in continual alarm.

A naval or sea army is a number of ships of war equipped and manned with sailors, mariners, and marines, under the command of an admiral, with the requisite inferior officers under him.

Army, Standing. In the ancient republics the proportion of soldiers to the rest of the people, which is now as about 1 to 100, might then be as one to eight. The reason is found in that equal partition of lands which the ancient founders of commonwealths made among their subjects; so that every man had a considerable property to defend, and means to defend it with: whereas, among us, the lands and riches of a nation being shared among a few, the rest have no way of subsisting but by trades, arts, and the like; and have neither any free property to defend, nor means to enable them to go to war in defence of it. While this equality of lands subsisted, Rome, though only a small state, being refused the succours which the Latins were obliged to furnish, after the taking of the city in the consulate of Camillus, presently raised ten legions within its own walls; which was more, Livy assures us, than they were able to do in his time when they were masters of the greatest part of the world: 'a full proof,' adds the historian, 'that we are not grown stronger; and that what swells our city is only luxury, and the means and effects of it. Our armies anciently were a sort of militia, composed chiefly of the vassals and tenants of the lords. When each company had served the number of days or months enjoined by their tenure, or the customs of the fees they held, they returned home.'

One of the first standing armies of which we have any distinct account is that of Philip of Macedon. His frequent wars with the Thracians, Illyrians, Thessalians, and some of the Greek cities in the neighbourhood of Macedon, gradually formed his troops, which in the beginning were probably militia, to the exact discipline of a standing army. When he was at peace, which was very seldom, and never for any long time together, he was careful not to disband it. It vanquished and subdued after a long and violent struggle the gallant and well-exercised militias of the principal republics of ancient Greece; and afterwards, with very little effort, the effeminate and ill-disciplined troops of the Persians. The fall of the Greek republics and of the Persian empire, was the effect of the irresistible superiority which a standing army has over every sort of militia. It is the first great revolution in the affairs of mankind of which history has preserved any distinct or circumstantial account. The fall of Carthage, and the consequent elevation of Rome, is the second. All the varieties in the fortune of those two famous republics may very well be accounted for from the same cause.

From the end of the first to the beginning of the second Carthaginian war, the armies of Carthage were continually in the field, and employed under three great generals, who succeeded one another in command; Hamilcar, his son-in-law Asdrubal, and his son Hannibal; first in chastising their own rebellious slaves, afterwards in subduing the revolted nations of Africa, and, lastly, in conquering the great kingdom of Spain. The army which Hannibal led from Spain into Italy must necessarily, in those different wars, have been gradually formed to the exact discipline of a standing army. Though the Romans, in the mean time, had not been altogether at peace, yet had they not during this period been engaged in any war of very great consequence; and their military discipline, it is generally said, was a good deal relaxed. The Roman armies which Hannibal encountered at Trebia, Thrasymenus, and Cannæ, were militia opposed to a standing army. This circumstance, it is probable, contributed more than any other to determine the fate of those battles. The standing army which Hannibal left behind him in Spain, had the like superiority over the militia which the Romans sent to oppose it, and in a few years, under the command of the younger Asdrubal, expelled them almost entirely from that country. Hannibal was ill supplied from home. The Roman militia being continually in the field, became in the progress of the war a well disciplined and well exercised standing army; and the superiority of Hannibal grew every day less and less. Asdrubal judged it necessary to lead the whole, or almost the whole, of the standing army which he commanded in Spain, to the assistance of his brother in Italy. In this march he is said to have been misled by his guides; and in a country which he did not know, was surprised and attacked by another standing army, in every re-

spect equal or superior to his own, and was entirely defeated. When Asdrubal had left Spain, the great Scipio found nothing to oppose him but a militia inferior to his own. He conquered and subdued that militia; and in the course of the war, his own troops necessarily became well disciplined. They were afterwards carried into Africa, and found nothing but a militia to oppose them. In order to defend Carthage it became necessary to recal the standing army of Hannibal. The disheartened and frequently defeated African militia joined it, and at the battle of Zama composed the greater part of the troops. The event of that day determined the fate of the two rival republics.

From the end of the second Carthaginian war till the fall of the Roman republic, the forces of Rome were in every respect standing armies. That of Macedon, although far inferior, made some resistance to their arms. In the height of their grandeur it cost them two wars, and three great battles, to subdue that little kingdom; of which the conquest would probably have been still more difficult, had it not been for the cowardice of its last king. Under the Roman emperors the standing armies, those particularly which guarded the German and Pannonian frontiers, became dangerous to their masters, against whom they used frequently to set up their own generals. In order to render them less formidable Dioclesian withdrew them from the frontier, where they had always before been encamped in great bodies, generally of two or three legions each, and dispersed them in small bodies through the different provincial towns; from whence they were scarcely ever removed, but when it became necessary to repel an invasion. Small bodies of soldiers quartered in trading and manufacturing towns, and seldom removed from those quarters, became themselves tradesmen, artificers, and manufacturers. The civil came to predominate over the military character; and the standing armies of Rome gradually degenerated into a corrupt, neglected, and undisciplined militia, incapable of resisting the attack of the German and Scythian militias, which soon afterwards invaded the western empire. It was now only by hiring the militia of some of those nations to oppose to that of others, that the emperors were for some time able to defend themselves. The fall of the western empire is the third great revolution in the affairs of mankind, of which ancient history has preserved any distinct or circumstantial account. It was brought about by the irresistible superiority which the militia of a barbarous, has over that of a civilised, nation. When a civilised nation depends for its defence upon a militia, it is at all times exposed to be conquered by any barbarous nation which happens to be in its neighbourhood. The frequent conquests of all the civilised countries in Asia, by the Tartars, sufficiently demonstrates this: while a well regulated standing army, however occasionally dangerous to liberty, is superior to every militia.

Army Lands, in geography, sundry districts in the United States of America, lying on the north of the Ohio, and to the westward of Pennsylvania, situated between 80° and 91° lon. W., and 37° and 41° lat. N.

ARMYNE (Mary), an illustrious English lady, the daughter of Henry Talbot, fourth son of George earl of Shrewsbury, and wife of Sir William Armyne. She was a woman of great talents, and exemplary piety. She had a good understanding of the French and Latin languages, and was well versed in history and divinity. She made a practice of distributing books among the poor; and she gave considerable sums to the missionaries employed in converting the Indians in North America. Besides many other deeds of public beneficence, she endowed three hospitals. She died in 1675.

ARNABOS, in the materia medica, an aromatic drug, described by Paulus Ægineta and other Greek physicians, and supposed to be the same with the zarnab of Avicenna, and the carpesia of the more ancient Greek writers. It was much used as an aromatic and cordial, and allowed in many cases to be a good substitute for cinnamon. It was composed of the young shoots of the cubeb-tree dried.

ARNALD (Richard), an English divine, born in London, and educated at Ben'et College, Cambridge. He became fellow of Emmanuel College; and in 1728 he took the degree of B. D. when he was presented to the rectory of Thurcaston in Leicestershire. He is chiefly celebrated for his Commentary on the Apocrypha; he also published several sermons. He died in 1756.

ARNALDIA, or Arnoldia, in physic, a slow malignant kind of disease, formerly frequent in England; the most distinguishing symptom whereof was a falling off of the hair. Authors are much at a loss for the nature of this disease, which appears to have been peculiar to our country. From the description given of it in an ancient chronicle, Mollerus concludes it to have been a species of the venereal disease, as that distemper appeared in those days in this country.

ARNÆA, in entomology, a species of papilio, a native of Surinam, the lea of Cramer and others.

ARNALL (William), a noted political writer in defence of Sir Robert Walpole, was originally an attorney's clerk; but being recommended to Walpole, he employed him for a course of years in writing the Free Briton, and other papers, in defence of his administration. By the report of the secret committee he appears to have received in the space of four years no less a sum than £10,997. 6*s*. 8*d*. out of the treasury for his writings! but giving way to extravagance, and his supplies stopping on Sir Robert's resignation, he died broken-hearted and in debt, in the twenty-sixth year of his age. His invention was so quick, that his employer used to say, no man in England could write a pamphlet in so little time as Arnall.

ARNAUD, D'Andilly (Anthony), the son of a celebrated advocate of the parliament of Paris, and a doctor of the Sorbonne, was born in 1612. He published in 1643, A Treatise on frequent Communion, which highly displeased the Jesuits; and in the disputes which broke out about this time in the university of Paris, and in which he took a zealous part with the Jansenists, helped to increase the animosity. He then wrote two letters on Absolution, which the faculty of divinity

condemned, and Arnaud was expelled the society. Upon this he retired, and during a retreat, which lasted nearly twenty-five years, he composed works on grammar, geometry, logic, metaphysics, and theology. In 1679 he withdrew from France, lived in obscurity in the Netherlands, and died in 1694. His heart, at his own request, was sent to be deposited in the Port Royal.

ARNAUD, D'ANDILLY (Robert), eldest brother of Anthony, was born in 1588; and, being introduced young in court, was employed in many considerable offices, all which he discharged with great integrity and reputation. In 1644 he quitted business, and retired into the convent of Port Royal des Champs, where he passed the remainder of his days; he enriched the French language with many excellent translations of different writers, as well as with religious compositions of his own. He died in 1674; his works are printed in 8 vols. folio

ARNAUD, DE MEYRVEILH, or MEREUIL, a poet of Provence, who lived at the beginning of the thirteenth century. He wrote a book entitled Les Recestenas de sa Comtesse, and a collection of poems and sonnets. He died in 1220. Petrarch mentions him in his Triumph of Love.

ARNAUD, DE VILLA NOVA, a famous physician, who lived about the end of the thirteenth, and beginning of the fourteenth, century. He studied at Paris and Montpelier, and travelled through Italy and Spain. He practised astrology, and upon this foundation he published a prediction, that the world would come to an end in the middle of the fourteenth century. He practised physic at Paris for some time; but, having advanced some new doctrines, he drew upon himself the resentment of the university; and his friends, fearing he might be arrested, persuaded him to retire from that city. Upon his leaving France he retired to Sicily, where he was received by Frederic king of Arragon with the greatest marks of kindness and esteem. Sometime afterwards this prince sent him to France, to attend Pope Clement in an illness; and he was shipwrecked on the coast of Genoa about the year 1313. The works of Arnaud, with his life prefixed, were printed in one volume folio, at Lyons in 1520, and at Basil in 1585, with the notes of Nicolas Tolerus

ARNAUTS, cavalry belonging to the Grand Seignior.

ARNAY-LE-DUC, a town of France, in the department of Cote d'Or, which carries on a pretty good trade. It is seated in a valley near the river Arroux, twenty-five miles N. W. of Baune. Population 2750. Lon. 4° 32′ E., lat. 47° 7′ N.

ARNDT (John), a famous Protestant divine of Germany, born at Ballenstadt, in the duchy of Anhalt, in 1555. At first he applied to the study of physic; but falling into a dangerous sickness he made a vow to change his profession for that of divinity, if he should be restored to health; which he accordingly did upon his recovery. He was minister first at Quedlinburg and then at Brunswick. In 1611 George duke of Lunenburg, who had a high opinion of his integrity and sanctity, gave him the church of Zeli, and appointed him superintendant of all the churches in the duchy of Lunenburg; which office he discharged for eleven years, and died in 1621. He wrote, in high Dutch, A Treatise on true Christianity, which has been translated into several languages.

ARNE (Dr. Thomas Augustine), distinguished by his skill in music, was the son of Mr. Arne, an upholsterer in Covent Garden, the brother of Mrs. Cibber the actress. He was early devoted to music, and soon became eminent in his profession. In July 6, 1759, he had the degree of doctor of music conferred on him at Oxford. His compositions are universally applauded, and he was also particularly skilful in instructing vocal performers. He died March 5, 1778, having written the following operas: Artaxerxes, in 1762; The Guardian Outwitted, 1764; and The Rose, in 1778.

ARNEBERG, a town of Brandenburg, seated on the Elbe, between Angermund and Werben, three miles distant from each. It was taken from the Swedes in 1631, and is now subject to Prussia. Population 1080.

ARNEE, a town and fortress of Hindostan, in the Carnatic, seventy-five miles south-west of Madras, and fourteen south of Arcot. In the war of the Carnatic between the English and French in 1751, lord Clive, then colonel-commandant of the British forces, laid the foundation of his military fame in a battle with the troops of Chunda Saheb, near this place, which was followed by the reduction of Timery and Conganzam. Hyder Ali, in his invasion of the Carnatic in 1782, made the fortress his great magazine of stores. It stands in N. lat. 12° 39′ and E. long. 79° 24′.

ARNEMUYDEN, a small sea-port town on the island of Walcheren, in the Dutch province of Zealand. It was in former times a place of consequence, and is probably the Hanse town, Arnemunda, the position of which has puzzled so many geographers. It had a considerable trade in the salt prepared there; and has still the remains of its ancient fortifications; three miles east of Middleburg, and six N. N. E. of Flushing.

ARNGASK, a parish of Scotland, comprehending a part of three different counties, which meet in it, viz. Fifeshire on the east, Perthshire on the west and north-west, and Kinross-shire on the south. It contained, in 1790, five hundred and fifty-four houses. The soil is various, and the climate salubrious.

ARNHEIM, or ARNHEM, a town of the United Provinces in Guelderland, capital o. Veluwe, seated on the Rhine, thirty miles east of Utrecht. It is adorned with several fine churches, particularly that of St. Walburg and of St. Eusebius, which last has a very high tower. The town has five gates, and several fine ramparts, part of which are washed by the Rhine, and the other parts have wide and deep ditches about them. There is a canal between this place and Nimeguen, made at the expense of both towns, on which boats pass backwards and forwards to carry on trade. The air is very healthful. Long. 5° 55′ E., lat. 52° 6′ N.

ARNICA, LEOPARD'S BANE, in botany, a genus

of the polygamia superflua order, belonging to the syngenesia class of plants; natural order forty-ninth, compositæ-discoideæ. The receptacle is naked; the pappus simple; and the filaments five, without antheræ. There are seven species, all natives of Ethiopia except the two following: 1. A. Montana, with oval leaves, grows naturally on the Alps, and also on many of the high mountains in Germany, and other cold parts of Europe. The roots of this species, when planted in a proper soil and situation, spread very far under the surface, and put out many entire oval leaves, from between which the flower-stems arise, which grow about a foot and a half high. The top is terminated by a single yellow flower, composed of many florets, like those of the dandelion. These are succeeded by oblong seeds, which are covered with down. This plant delights in a moist shady situation, and may be propagated by parting the roots in autumn, when the stalks begin to decay; or by the seeds sown in autumn soon after they are ripe, for those sown in spring often fail. It has an acrid bitter taste, and, when bruised, emits a pungent odor, which excites sneezing. On this account the country people in some parts of Germany use it as snuff, and smoke it like tobacco. It was formerly represented as a remedy of great efficacy against effusions of blood, from falls, bruises, or the like; and in jaundice, gout, nephritis, &c.; but in these affections it is now very little, if at all, employed. Of late it has been principally recommended in paralytic affections, and in cases where a loss or diminution of sense arises from an affection of the nerves, as in instances of amaurosis. In these it has chiefly been employed under the form of infusion. From a dram to half an ounce of the flowers has been directed to be infused in a pint of boiling water, and taken in different doses in the course of the day. It is also taken in the form of a pretty strong decoction taken in small doses frequently repeated, or in that of an electuary with honey. Its real influence however still remains to be determined by future observations; but it is one of those active substances from which something may be expected. 2. A. Scopioides, with sawed leaves growing alternately, is a native of Bohemia and Siberia. The roots of this sort are much jointed, and divided into many irregular fleshy off-sets, which are variously contorted; from whence some superstitious persons have imagined that they would expel the poison of scorpions, and cure the wounds made by the sting of that animal. This species is propagated like the other. Both are very hardy, and require only to be kept free from weeds.

ARNICÆ, in entomology, a species of staphylinus found on the Arnica Montana. It is black, except on the thorax and antennæ, where it is ferruginous; the legs are testaceous. Also a species of musca, found on the same plant, the wings of which are gray and hooked.

ARNIGIO (Bartholomew), the son of a blacksmith of Brescia in Lombardy, born 1523, died 1577. Having a turn for literature, at the age of eighteen he abandoned the business of his father, and succeeded so well in his studies, that he at length obtained a doctor's degree, which was conferred on him by the university of Padua. He was, however, less successful as a physician than as a poet, in which latter character he produced Lettere, Rime, et Orazione, 4to.; Meteoria, 4to.; Lettura letta publicamente sopra il sonetto del Petrarca, 8vo.; La Medicina d'Amore; Dieci Vegliedegli ammendati Costumi dell' umana Vita, 4to.; and Le Rime, 8vo.

ARNISÆUS (Henningus), a philosopher and physician of great reputation, about the beginning of the seventeenth century. He was born at Halberstad in Germany, and was professor of physic in the university of Helmstad. The most remarkable of his works are; 1. De Authoritate Principum in Populum semper Inviolabili, in which he maintains that the authority of princes ought not to be violated; 2. De Jure Majestatis libri tres, and Reflectiones Politicæ, all printed at Francfort in 1610, 1612, and 1615. He was invited to Denmark, and was made counsellor and physician to the king. He travelled into France and England, and died in November, 1635. He wrote also several philosophical, medicinal, and political treatises.

ARNO, a large and rapid river of Italy, in Tuscany, which it divides, and in its course washes Florence and Pisa; rising in the Apennines, to the east of Florence, near a village called S. Maria della Gratie, on the borders of Romagna, fifteen miles to the west of the sources of the Tiber; and then turning southward towards Arretium, it is there increased by the lakes of the Clanis; after which it runs westward dividing Florence into two parts, and, at length washing Pisa, falls four miles below it into the Tuscan Sea.

ARNO, a pleasant valley of Italy, through which the river Arno runs, and which abounds in all kinds of fruits. Part of it is thought to have been formerly a lake, before the Arno made its passage through the rock at Rignano. The bones of elephants are found in digging through its strata, which are very regular.

ARNOBIUS, professor of rhetoric at Sicca in Numidia, towards the end of the third century. Being bred up a Pagan, he at first opposed Christianity; but afterwards became desirous of embracing it. For this purpose he applied to the bishops to be admitted into the church. But they had some distrust of him, and before they would admit him, insisted on some proofs of his sincerity. In compliance with this demand, he wrote against the Gentiles; wherein he refuted the absurdities of their religion, and ridiculed the gods. In this treatise he has employed the flowers of rhetoric, and displayed great learning; but from an impatience to be admitted into the body of the faithful, he is thought to have been in too great a hurry in composing his work; and not having exact knowledge of the Christian faith, he published some very dangerous errors. St. Jerome, in his epistle to Paulinus, is of opinion that his style is unequal and too diffuse, and that his book is written without method. Vossius styles him the Varro of the ecclesiastical writers. Dupin observes, that his work is written in a manner worthy of a professor of rhetoric; the turn of his sentiments is very oratorical; but his

style is a little African, his expressions being harsh and inelegant. We have several editions of his work against the Gentiles; one published at Rome in 1542, others at Basil, Paris, and Antwerp; and one at Hamburg in 1610, with notes by Gerhard Elmenhorstius. He wrote also a piece entitled De Rhetoricæ Institutione; which is not extant.

ARNODI, in antiquity; from *αρνος*, a lamb, which was their usual reward, and *ωδη*, song, or singing; the rhapsodi, or public singers in Greece.

ARNOLD, a native of Brescia in Italy, who studied under the celebrated Peter Abelard. Upon his return to Italy he put on the habit of a monk, and opened his invectives in the streets of Brescia. He told the people he was sent to reform abuses, to pull down the proud and to exalt the humble. He then pointed his declamation against the bishops, against the clergy, against the monks, and finally against the Roman pontiff himself; to the laity only he was indulgent. 'Churchmen,' said he, 'who hold benefices, bishops who have domains, and monks that have possessions, will meet with eternal punishment.' 'These things,' continued he, 'belong to the prince; he may give them to whom he pleases, but he must give them to the laity. It is on their tithes, and the voluntary contributions of the people, that those sons of God must live: they must be frugal, continent, and mortified.'—The church of Brescia was soon thrown into the greatest confusion, and the people, already prejudiced against their ministers, threatened to overturn their altars. Indeed, nothing could be more glaringly offensive than the ostentatious parade of the bishops and great abbots, and the soft and licentious lives of the monks and clergy. A grand council was held at Rome in 1139; Arnold was cited to appear before it. His accusers were the bishop of Brescia, and many others, whom he had ridiculed and insulted. From such judges he could not look for much indulgence. He was found guilty, and sentenced to perpetual silence. Upon this he left Italy, crossed the Alps, and found a refuge in Zurich. Though Arnold had quitted Italy, yet had his opinions taken deep root, and Rome itself was infected by them. Irritated by the conduct of their master, Innocent II., the Roman people assembled in the capitol. It was proposed that the power of the pontiff, which they called exorbitant, should be restrained; this was carried: when suddenly, inspired as it were by the genius of the place, they moved that the senate, which for years had been abolished, should be restored. The proposition was received with the loudest acclamations. Innocent in vain opposed the bold design; it spread irresistibly, and for a moment seemed to rouse the fallen spirit of the nation. The pope viewed with horror the reverse of fortune which threatened the tiara; he fell sick and died. Under his successors Celestine and Lucius, whose reigns were but of a few months, the Romans pursued their darling object. They waited on the latter, and, in an imperious tone, demanded the restitution of all the honors and civil rights which had been usurped from the people. The prince of the senate, said they, whom we have chosen, will best administer the important trust: the tithes and offerings of the faithful will sufficiently answer all the exigencies of your holiness: it was thus that our ancient bishops lived.—Lucius survived this event but a few days. His successor was Eugenius III. the friend and disciple of the renowned Bernard. The night before his consecration the senators assembled, and it was agreed, that either he should solemnly confirm all their proceedings, or they would annul his election. This resolution was notified to him. He called together his friends; and it was their advice, that he should neither accede to their extravagant demand, nor expose himself, by a refusal, to the fury of the populace. He therefore silently withdrew from Rome, and retired to a neighbouring fortress. Arnold, who, in banishment, had contemplated the effect of his admonitions on the minds of the Romans, and the success which seemed to follow their exertions, was now informed that the pope had retired, and that the gates of the capitol were open to receive him: it was likwise suggested to him, that his presence was more than ever necessary, to give energy to their resolves, form to their plans, and stability to their undertakings. Arnold took fire at the news; an unusual swell of enthusiasm filled his breast; and he fancied that, like Junius Brutus, he was called at once to give liberty to Rome. At his appearance a new stream of vigor animated the citizens; they called him their friend and deliverer. The Brescian walked amongst them; his deportment was humble, his countenance emaciated, his address affable, and he spoke to them of moderation, of submission, of obedience. With the nobles and new senators also he was mild and diffident, speaking much of virtue and of respect for religion and the laws. But no sooner was he sensible of his own real influence, and saw the lengths to which the revolters had carried their designs, than he harangued the people; he talked of their forefathers the ancient Romans, who, by the wisdom of the senate and the valor of their armies, had conquered nations and subdued the earth: he dwelt on the names and the achievements of the Bruti, the Gracchi, and the Scipios; and of these men, said he, are you not the children? He advised that the capitol be instantly repaired, that the equestrian order be restored, that the people have their tribunes, that dignity attend the senate, and that the laws, which had been silent and neglected, be revived in all their vigor. He spoke of the pope as of a deposed and banished tyrant: 'But should you again be disposed (continued he) to admit him within these walls, fix your own rights and determine his. He is but your bishop: let him therefore have his spiritual jurisdiction. The government of Rome, its civil establishments, and its territories belong to you. These you will keep if you have the spirit of men, and the hearts of Romans.' Fired by this harangue, the people, headed by the most disaffected nobles, attacked the few cardinals and churchmen who remained in the city, set fire to the palaces, and compelled the citizens to swear obedience to the new government. Moderate men were shocked at

these excesses, but it was in vain to oppose the torrent: they submitted, looking forward, with some curiosity, to the termination of an event which had begun in extravagance, and could not but end in disappointment. Eugenius till now viewed, with concern, the wild derangement of the people: but when it seemed that their eyes were opened to their own excesses, he could be inactive no longer. He excommunicated the ringleaders of the faction; and at the head of his troops marched against the enemy. His friends within the city, who were numerous, co-operated with his designs, and in a few days overtures for peace were made to the pontiff. He acceded to them, but on condition that they should annul the arrangements they had made, and if they would have senators, that they should acknowledge all their power was from him. The people were satisfied, and they threw open the gates, through which Eugenius entered, among the acclamations of a fawning and inconstant multitude. Before this event Arnold had retired; but he left behind him many friends strongly attached to his person and principles. Of himself we hear little more till the reign of Adrian our countryman; when, on account of fresh tumults, he and his adherents were excommunicated, and Rome was threatened with an interdict unless they expelled the whole party from their walls. This they did. The Arnoldists retired with their champion into Tuscany, where he was received as a prophet and honored as a saint. His enemies, however, prevailed; he was made prisoner, and conducted under a strong escort to Rome. In vain was great interest made to save his life; he was condemned to the stake, and executed, and his ashes thrown into the Tiber, lest the people should collect his remains and venerate them as the relics of a sainted martyr.

Arnold (Benedict), an American general, whose fortune and character were singular. He was born in New England and bred a surgeon, but gave up this profession for a sea life; and was for a number of years master and supercargo of a trading vessel. When hostilities between Great Britain and the colonies commenced he took part with his native country, and was chosen captain of a company of volunteers at Newhaven. He soon after rose to the rank of colonel, and commanded an expedition to Canada. Designing to take Quebec by surprise, he conducted his troops through very great difficulties, but the garrison having had timely notice was fully prepared. Montgomery joining him soon after, they attempted to storm the city, in which he received a wound in the leg; and on the death of General Montgomery he retired with his troops to Crown Point. He afterwards commanded a flotilla on Lake Champlain, in which he distinguished himself by his bravery. He continued actively employed on the American side till 1780, when he began a correspondence with Sir Henry Clinton for betraying West Point to the British; in which unfortunate negociation major André became a victim. Arnold himself narrowly escaped to an English ship of war. He now showed equal ardor on the British side; and at the end of the war retired to England, where he had a pension. Some time after he went to Nova Scotia, from whence he sailed for the West Indies, but was taken by the French, from whom he made his escape. He died in London in 1801.

Arnold (Samuel), an eminent composer of music, was educated at the Chapel Royal, St. James's, under Mr. Gates and Dr. Nares. About 1760 he became composer to Covent Garden theatre, and the pieces he there produced were much admired. His Cure of Saul brought crowded houses; and still more did the Prodigal Son, an oratorio, for which the degree of doctor was conferred on him at Oxford in 1773. He was then proprietor of Mary-le-bone gardens, at that time famous for public amusement. When Dr. Nares died, in 1783, Arnold was appointed organist and composer to the Chapel Royal. In 1786 he began an elegant edition of Handel's works. He died in October, 1802, and was interred in Westminster abbey.

Arnold, a small river of Lower Canada, called after the American general of that name, and falling into the lake Meganteck.

ARNOLDUS (Gothofredus), pastor and inspector of the churches of Perleberg, and historiographer to the king of Prussia, was born at Annaburg in the mountains of Misnia in 1666. He was a zealous defender of the Pietists, a sect among the German Protestants, and composed a great number of religious works; particularly an Ecclesiastical History, giving an account of the doctrines and manners from the first ages, in which he frequently animadverts upon Cave's Primitive Christianity. He died in 1714.

ARNON, in ancient geography, a river that rises in the mountains of Gilead, and runs south-west between the borders of the Moabites and Ammonites on the other side Jordan. Josephus says it rises on the borders of Arabia, and falls into the Dead Sea. It is also called the river of Gad, as appears from 2 Sam. xxiv. 5, compared with 2 Kings x. 33.

ARNOTTA, or Arnot, in botany, a name given by the peasants of Burgundy, and many other places, to certain roots which they frequently turn up, from five to six inches depth, in ploughing the ground. They carefully collect these and eat them, after roasting in the ashes, or otherwise; by which sort of cooking they acquire the taste of a chestnut, and are found to be a very wholesome and nourishing food. They are blackish on the outside and white within, and are of the size of a small walnut. They are common in the north of Scotland.

ARNOULD (St.), a town of France, in the department of Eure and Loire, in the forest of Ivelin, on the road from Chartres to Paris.

ARNSTADE, or Arnstadt, a town of Germany, in Thuringia, on the river Gera, ten miles south-west of Erfout. The Schwartzburg magistracy has its station here, and the town has a considerable trade in corn and wool. Population 4600. Lon. 11° 13′ E.; lat. 50° 48′ N.

ARNSTEIN, a handsome town on the river Lahn, containing a noble abbey founded by Count Louis of Arnstein. It was originally endowed with the imperial village of Winden; but was secularised in 1802, and made over to the prince of Nassau-Weilburg. Population 2000.

ARNULPH, or ERNULPH, bishop of Rochester in the reign of Henry I. He was born in France, where he was some time a monk of St. Lucian de Beauvais. Lanfranc, archbishop of Canterbury, invited him over to England, and placed him in the monastery of Canterbury, where he lived a private life till Lanfranc's death. When Anselm succeeded, Arnulph was made prior of the monastery of Canterbury, and afterwards abbot of Peterborough. In 1115 he was consecrated bishop of Rochester, which see he held nine years, and died in 1124, aged eighty-four. He wrote a piece in Latin entitled Textus Roffensis, concerning the foundation, endowment, charters, laws, &c. of the church of Rochester: it is preserved in the archives of that church; an Epistle in answer to some Questions of Lambert, abbot of Munster; and an Epistle on incestuous Marriage.

ARNULPHIN, a coin of the value of a ducat and a half, current in some parts of France in the fifteenth century.

ARNWAY (John), a clergyman distinguished by his benevolence and loyalty to king Charles I. was descended from a good family in the county of Salop, from which he inherited a considerable estate. He was educated at Oxford; and, having received holy orders, obtained the rectories of Hodnet and Ightfield, where he distinguished himself by his piety and exemplary charity. The civil war breaking out, he raised and clothed eight troopers for the service of king Charles I. upon which his house was plundered by the parliament's army. He then went to Oxford to serve the king in person, which subjected him to a new train of misfortunes; for his estate was soon after sequestered, and himself imprisoned till the king's death; after which he went to the Hague, where he published the Tablet, or the Moderation of Charles I. the Martyr; and an Alarm to the Subjects of England. He at last went to Virginia, where he died in 1653.

AROBAS, or AROBE; by some spelt and pronounced arrobe; in Spanish, arrobas; in the language of Peru, arrou; a weight used in Spain, Portugal, Goa, Brasil, and in all Spanish America. All these arobas are scarcely like each other but in name, being very different in weight, and in proportion to the weights of other countries. The aroba of Madrid, and almost all over Spain, weighs twenty-five Spanish pounds.

AROER, in ancient geography, 1. A city, partly on the north bank and partly in an island of the river Arnon. Sihon the Amorite took it from the Moabites; Moses took it from him and gave it to the tribe of Gad, who rebuilt it, Num. xxxii. 34. When the Gadites were carried captives to Assyria, the Syrians seem to have taken possession of it; but were soon obliged to leave it to the Moabites, under whom the Assyrians seem to have rendered it a desert, Isa. xvii. 2. It had the same fate from the Chaldeans, under Nebuchadnezzar, Jer. xlviii. 20. 2. A city on the south of Judah, to whose inhabitants David sent part of the spoil which he took from the Amalekites, 1 Sam. xxx. 28. 3. A city near Rabbah of the Ammonites, Josh. xiii. 25.

AROMA; Lat. spice, flavor, fragrance. Aroma is by some authors peculiarly applied to myrrh.

AROMA GERMANICUM, a denomination given by Platerus to elecampane; by others to juniper-berries, on account of the great esteem in which they are held by the Germans for their spicy warm qualities, being by many preferred to ginger.

AROMATA, in ancient geography, a town of Lydia, famous for its generous wines, and hence the appellation. Also a trading town and promontory of Ethiopia, at the termination of the Sinus Avalites of the Red Sea.

AROMAT'IC, AROMAT'ICAL, AROMAT'ICKS, AR'OMATIZE, AROMATI'ZER. } From *aroma*, a substance which supplies perfume, especially of the spicy kind. Spicy, scented with spice.

All things that are hot and *aromatical* do preserve liquors or powders. *Bacon.*

Drink the first cup at supper, hot; and, half an hour before supper, something hot and *aromatized.* *Id.*

Volatile oils refresh the animal spirits; but likewise are endued with all the bad qualities of such substances, producing all the effects of an oily and *aromatical* acrimony. *Arbuthnot.*

Or quick effluvia darting through the brain,
Die of a rose in *aromatick* pain. *Pope.*

AROMATICA, in ornithology, the name given by Gmelin to the species of columba, or pigeon, called by Brisson columba viridis Amboinensis, and by Latham aromatic pigeon. It is a native of the island of Amboyna, and is about ten inches and a half in length; the general color is olive-green; the back chestnut; on the wing a double bar of black edged with yellow.

AROMATITIS, in ancient physiology, a kind of bituminous stone, by some represented as a gem, both in smell and color resembling myrrh. It is said to be found in Arabia and Egypt, and to have been in great use as a perfume.

ARONA, a town of Italy, in the duchy of Milan, with a strong castle, seated on the lake Maggiore. Upon an eminence, near the lake, there is a statue of St. Barromeus, the patron of Milan, in bronze, thirty-five ells high, upon a pedestal of twenty-five ells, making in all sixty ells in height. The hill is hence called Monte di St. Carlo. The position of the town on the lake is favorable for trade, and the adjoining country abounds in excellent wine. Population 4000. Seventeen miles N. N. W. of Novara. Long. 8° 32′ E., lat. 45° 46′ N.

ARoo, a large island to the south of Papua, in the 135th degree of east longitude, and the sixth of south latitude. In length it may be estimated at 140 miles, by thirty-five miles the average breadth. The Chinese merchants carry on a traffic with this island, from whence they receive pearls, birds-nests, tortoise-shells, and slaves

ARO-ORCHIS, in botany. See GALANGAL.

AROPH, a contraction of aroma philosophorum; a name given to saffron. Aroph is also used to denote mandragora.

AROPH PARACELSI, a kind of chemical flowers, probably of the same nature with the ens veneris, elegantly prepared by sublimation, from equal quantities of lapis hæmatitis and sal ammoniac.

Aroph is also used by Paracelsus synonymously with lithontriptic.

ARORNOS, in botany, a name by which some authors have called the juniper.

AROSBAY, a town in the East Indies, on the coast of the island of Madura, near Java.

AROUND', *prep.* & *adv.* On round. Ital. *ronda;* Fr. *ronde;* from the Lat. *rotundus*, from *rota*, a wheel.

No war, or battle's sound
Was heard the world *around:*
The idle spear and shield were high up hung.
Milton. On the Nativity.

He shall extend his propagated sway,
Where Atlas turns the rolling heav'ns *around,*
And his broad shoulders with their lights are crown'd.
Dryden.

And all above was sky, and ocean all *around.* *Id.*

From young Iulus' head
A lambent flame arose, which gently spread
Around his brows, and on his temples fed. *Id.*

So do the dark in soul expire,
Or live like scorpion girt with fire;
So lives the mind remorse hath riven,
Unfit for earth, undoom'd for heav'n,
Darkness above, despair beneath,
Around it flame, beneath it death.
Lord Byron. The Giaour.

AROURA, a Grecian measure of fifty feet. It was more frequently used for a square measure of half the plethron. The Egyptian aroura was the square of 100 feet.

AROUSE'. Supposed to derive its origin from the past participle of the verb Arise.

This is the wine
Which, in former time,
Each wise one of the magi
Was wont to *arouse,*
In a frolicsome bouse,
Recubans sub tegmine fagi.
F. Beaumont. In praise of Sack.

How loud howling wolves *arouse* the jades,
That drag the tragic melancholy night.
Shakspeare.

But absent, what fantastick woes *arous'd*
Rage in each thought, by restless musing fed;
Chill the warm cheek, and blast the bloom of life.
Thomson.

AROW'. On row. In a regular line or order.

For joye he hent hire in his armes two;
His herte bathed in a bath of bliss,
A thousand time *arow* he gan hire kisse.
Chaucer. The Wife of Bathes Tale, p. 275.

My master and his man are both broke loose,
Beaten the maids *arow,* and bound the doctor.
Shakspeare. Comedy of Errors.

Three days *arow,* to pass the open street.
Mirror for Magistrates, p. 321.

Then some green gowns are by the lasses worn,
In chastest plays, till home they walk *arow.* *Sidney.*

But with a pace more sober and more slow,
And twenty, rank in rank, they rode *arow.*
Dryden.

ARPAD, in ancient geography, is thought to have been a city of Syria. It was always placed with Hamath. 2 Kings, xix. 13. Isa. x. 9. Jer. xlix. 23. Sennacherib boasts of having reduced Arpad and Hamath, or of having destroyed the gods of these places. Hamath is the same with Arad or Arvad, as it is sometimes called in Hebrew.

ARPAGIUS, or HARPAGIUS, among the ancients, a child who died in the cradle, or in early youth. The word is formed from the Greek αρπαζω, I snatch. The Romans made no funerals for their arpagii. They neither burnt their bodies, nor made tombs, monuments, nor epitaphs for them. In after-times it became the custom to burn such as had lived to the age of forty days, and had cut any teeth; and these they called Αρπακτοι, or Αρπαγμενοι, q. d. rapti, ravished. The usage seems to have been borrowed from the Greeks; among whom, Eustathius assures us, it was the custom never to bury their children either by night or full day, but at the first appearance of the morning; and that they did not call their departure by the name of the death, but by a softer appellation, Ημερας αρπασῃ, importing that they were ravished by Aurora, or taken away to her embraces.

ARPAJON, a small town of France, in the department of the Seine, arrondissement of Corbeil. It is situated on the river Orge, and contains 2100 inhabitants. The principal manufactures are of cotton and fire-arms. This place formerly gave the title of marquis to the family of Noailles.

ARPEGGIO, (Ital.) in music, implies that the several sounds of an accord should be heard, not together, but one after another, beginning always with the lowest.

ARPENT signifies an acre or furlong of ground; and, according to the old French account in doomsday-book, 100 perches make an arpent. The most ordinary acre, called l'arpent de France, is 100 perches square; some account it but half an acre.

ARPHAXAD, the son of Shem and father of Selah. Arphaxad was born a year after the deluge, and died at the age of 438. Genesis, xi. 12, &c.

ARPINAS, or ARPINO, (Joseph Cæsar), a famous painter, born in 1560, at the castle of Arpinas. He lived in great intimacy with pope Clement VIII. who knighted him. In 1600 he went to Paris with cardinal Aldrobandin, legate to the French court on the marriage of Henry IV. who created him a knight of St. Michael.—His coloring is thought to be cold, but there is spirit in his designs. What he painted of the Roman history is the most esteemed of all his works. He died at Rome in 1640.

ARPINUM, in ancient geography, a town of the Volsci, a little to the east of the confluence of the rivers Liris and Fibrenus, in the Terra di Lavoro; now decayed. It was the native place of Cicero, and C. Marius

ARQUA, a town of Italy, in the Paduan, a territory of Venice, remarkable for the tomb of Petrarch. It is ten miles south of Padua.

ARQUATA, in ornithology, the name of a bird, called also by some numenius, and commonly known in England by the name of the curlew. The male of this species is somewhat smaller than the female, and is called the jack curlew. It is of a very delicate taste.

ARQUATA MINOR, in ornithology, the wimbrel.

ARQUATUS MORBUS, a name given by some authors to the jaundice, from its resembling the colors of the rainbow, arcus cælestis.

ARQUEBUS A CROC is a sort of small fort gun, which carries a ball of about three half ounces; now only used in Old Castile.

ARQUEBUSE, a hand-gun. It seems to have anciently meant much the same as our carabine, or fusee.

AR'QUEBUSER, ARQUEBUSADE', ARQUEBUSIER'. } Ital. *archibuso*. An iron bow.

And now farewell both spear and shield,
Caliver, pistol, *arquebus*,
See, see, what sighs my heart doth yield,
To think that I must leave you thus,
And lay aside my rapier blade,
And take in hand a ditching spade.
Nicholas Breton, in Ellis, vol. ii.

A *harquebuse*, or ordnance, will be farther heard from the mouth of the piece, than backwards, or on the sides. *Bacon.*

He compassed them in with fifteen thousand *arquebusiers*, whom he had brought with him well appointed. *Knolles.*

ARQUEBUSADE, in medicine, a kind of water originally of French invention, recommended as useful in cases of gun-shot wounds, from whence it derives its name. The composition of it is not generally known, but it is said to be made from mint, sage, mugwort, &c. and lime-water distilled in wine. It is also called aqua vulneraria, aqua sclopetaria, and aqua catapultarum.

ARQUES, a town of France, in the department of the Lower Seine, seated on a river of the same name, four miles south-east of Dieppe, and four north-east of Longueville.

ARRACAN, or RAKHANG, a large province of the Burman or Ava empire, extending along the eastern side of the Bay of Bengal, from the Nauf in Chittagong, as far south as Cape Negrais. The Anoupectoumiou mountains bound it to the east; and towards the south approach so near to the sea, that, though its length may be estimated at 500 miles, in many places the breadth in land does not exceed ten miles, and nowhere more than 100. From the side of Chittagong, Arracan can only be approached by a march along the sea beach, interrupted by several channels, which owe their waters to the tide. From the quarter of Basseen and Negrais, it can only be invaded by water.

The sea-coast of Arracan is studded with islands and clusters of rocks of different sizes, at a small distance from the shore. Behind these islands the sea-coast is agreeably diversified with hills covered with trees, and valleys planted with rice.

Arracan is a fertile country, but much oppressed by the Burmans. Its ports are shut against all foreigners, and the natives much restricted in their privileges. It is subject to much rain, and the exhalations are unfavorable to European constitutions. Its inhabitants were formerly called Muggo, and previous to Bengal being under the protection of the English, used to commit great depredations on that country. At present there is little intercourse by land between the two countries, but a considerable trade is carried on by Burman merchants; who, embarking their goods on the Irravaddy, land them at Sembewgheen, whence they are carried by buffaloes or men to the city of Arracan. Here they are again embarked on deep narrow boats, which, after quitting the river, keep along the coast till they enter the Megna of Bengal, and proceeding through the Sunderbunds, land them on the shore of the Salt-water lake, three miles to the east of Calcutta. The principal articles are honey, wax, ivory, drugs, sapphires, rubies, and gold; in exchange they take back tissues, silks, muslins, European commodities of all kinds, pearls, and diamonds. The inhabitants of Arracan are worshippers of Boodh, or Godama, to whom they have dedicated a number of handsome temples. In common with the other natives of the eastern peninsula, they keep their women in great subjection, and make them perform all the laborious offices of life. In features they resemble the Chinese, and speak a language very different from that of Bengal. This country produces a number of very fine elephants.

ARRACAN, a large city, and capital of the province of that name, stands on the banks of a noble river, two tides journey from the sea. It was taken by the Burmans in the year 1783, and is at present the residence of a viceroy, who is very jealous of Europeans; a Portuguese vessel having been driven into the river by stress of weather, was confiscated. The harbour is said to have six fathoms water at the bar, and to be capable of containing a considerable fleet. The great inconvenience to which it is exposed, proceeds from the violence of the tides, which rise from fifteen to twenty feet. Long. 93° 6′ E., lat. 20° 47′ N.

ARRACHEE, in heraldry, a term applied to the representations of plants torn up by the roots.

ARRACK. See ARACK.

ARRAGON, a province of Spain, which, before the union with Castile, in the person of Charles V. was governed by its own king and laws. The kingdom of Arragon comprised the provinces of Valencia, Catalonia, and Mallorka. By Arragon is now understood the large province bounded by the Pyrenees on the north, Navarre and Castile on the west, Valencia on the south, and Catalonia on the east. The soil, though in some places sandy, stony, and mountainous, principally in the tract bordering on Catalonia, is on the whole productive, especially in the rich valley of Catalayud and on the banks of the rivers. It is said that in the time of the Romans the mines of Arragon were an object of great attention; and the remains of silver-mines may still be found. Copper, lead, and iron, however, are extremely plentiful; and the Arragonese blades, of which Martial and Pliny speak, were celebrated to a late time. The cultivation of the country has been of late improved, and Arragon abounds with olives and other fruits. Here are raised also maize, hemp, madder, and saffron; and excellent wine is exported in considerable quantities. So early as the year 1179 silk worms were reared at Cespe, and the quantity of silk made and exported in 1784 was 300,000. The mineral products are alum, vitriol, jasper, marble, lead, and iron; but the breeding of sheep forms the grand branch of industry. The wool is in high esteem with foreigners, particularly with the English, who use it in their

finest cloths. The natural history of this province is only peculiar from the number of wild beasts which infest it, in greater numbers than are to be found in any other part of Europe. The black bear, the lynx, the wolf, are commonly met with in the mountains towards the Pyrenees. It contains no more than 630,000 inhabitants, whereof 10,000 are priests, monks, and nuns, and above 9000 of the rank, or pretended rank of noblesse. The number of jurisdictions is thirteen, and Saragossa is the chief town.

ARRAH, a town of Hindostan, in the province of Bahar, district of Shahabad, the residence of a British judge and collector. It is situated in N. lat. 25° 32′, E. long. 84° 44′.

ARRAIGN′, } Corrupted and contracted
ARRAIGN′MENT. } from *ad rationem* [*ponere*]. To call the prisoner to the bar of the court to answer the matter charged upon him in the indictment.

Summon a session, that we may *arraign*
Our most disloyal lady; for, as she hath
Been publickly accused, so shall she have
A just and open trial. *Shakspeare.*

Then all thy saints assembled, thou shalt judge
Bad men and angels; they *arraigned* shall sink
Beneath thy sentence; hell, her numbers full,
Thenceforth shall be for ever shut.
Milton. Paradise Lost. book iii.

My own enemies I shall never answer; and, if your lordship has any, they will not *arraign* you for want of knowledge.
Dryden's Dedication to the Æneid.

Down, down, proud Satire! tho' a realm be spoil'd,
Arraign no mightier thief than wretched Wild.
Pope. Epilogue to the Satires.

Reverse of nature! shall such copies then
Arraign th' originals of Maro's pen? *Roscommon.*

He that thinks a man to the ground, will quickly endeavour to lay him there; for, while he despises him, he *arraians* and condemns him in his heart.
South.

One part, one little part, we dimly scan,
Through the dark medium of life's feverish dream;
Yet dare *arraign* the whole stupendous plan,
If but that little part incongruous seem.
Beattie's Minstrel.

ARRAIGNMENT, in law. The word in Latin, says Lord Hale, is no other than ad rationem ponere, and in French ad reson, or abbreviated a resn; for as the ancient word disrain, or derayn, imports in Latin disrationare, to disprove or evince the contrary of any thing that is or may be affirmed, so arraigne is ad rationem ponere, to call to account or answer. And this perhaps may be sufficient to show the meaning of the word, although not to declare its derivation; for it seemeth to have flowed unto the French tongue from its common origin with the Greek; of which we shall have little doubt, when we consider the verbs αγορευειν, καταγορευειν, and also διαγορευειν, as they are used in the classical remains of that language, and compare them with the terms arraigne, adraigne, disrayn, derayne.

The prisoner on his arraignment, though under an indictment of the highest crime, must be brought to the bar without irons and all manner of shackles and bonds, unless there be a danger of escape, and then he may be brought with irons. But at this day they usually come with their shackles upon their legs, for fear of an escape, but stand at the bar unbound, till they receive judgment.—2 *Hale*, 219.

In Layer's case, 1722, a difference was taken between the time of arraignment and the time of trial, and accordingly the prisoner was obliged to stand in irons at the bar during his arraignment; but when brought to trial, upon counsel desiring that his irons might be taken off, Lord J. C. Pratt said, the irons must be taken off; we will not stir till the irons are taken off. And in Rex v. Waite (for embezzlement) the prisoner, at the time of arraignment, desired that his irons might be taken off; but the court informed him, that they had no authority for that purpose until the jury were charged to try him. He accordingly pleaded Not guilty; and being put upon his trial the court immediately ordered his fetters to be knocked off. Also there is no necessity that a prisoner, at the time of his arraignment, hold up his hand at the bar, or be commanded so to do; for this is only a ceremony for making known the person of the offender to the court; and if he answer that he is the same person, it is all one.

A prisoner may stand mute two ways: 1. When he speaks not at all; in which case it is enquired, whether he stand mute of malice, or by the act of God; if by the latter, then the judge, ex officio, ought to enquire whether he be the same person; and of all other pleas, which he might have pleaded if he had not stood mute. 2. When he pleads not directly, or will not put himself upon the inquest to be tried. If he be found to be obstinately mute, then, if it be on an indictment of high treason, it is clearly settled that standing mute is equivalent to a conviction, and he shall receive the same judgment and execution. So likewise, in petty larceny, and in all misdemeanors, standing mute is equivalent to conviction. But in appeals or indictments for other felonies, or petit treason, it was the custom till of late not to consider him convicted, so as to pass judgment for the felony; but for his obstinacy he was to receive the terrible sentence of penance, or peine forte et dure; a method of torture by which he was pressed to death fasting, by large weights placed on his breast. Before this was pronounced, the prisoner was allowed not only trina admonitio, but also a convement respite for a few hours, and the sentence was distinctly read to him, that he might know his danger; and, after all, if he continued obstinate, and his offence was clergyable, he was allowed the benefit of his clergy, even though he was too stubborn to pray it. But in this respect the law is now altered; for by 12 Geo. III. cap. 20. standing mute in felony or piracy is made a conviction. To advise a prisoner to stand mute is an high misprision, a contempt of the king's court, and punishable by fine and imprisonment.

ARRAN, a mountainous island of Scotland, in the Frith of Clyde, between Kintyre and Cunningham; twenty-three miles in length and twelve in breadth, according to Walker, but seven according to Mr. George Stewart; if he means Scots miles, the estimates are nearly equal

Probably the best description of this island is the following, given by Mr. Pennant in his Tour, vol. ii. :—'Arran, or properly Arr-ian, 'the island of mountains,' seems not to have been noticed by the ancients. Camden indeed makes this island the Glota of Antonine, but no such name occurs in his Itinerary; it therefore was bestowed on Arran by some of his commentators. By the immense cairns, the vast monumental stones, and many relics of Druidism, this island must have been considerable in very ancient times. Here are still traditions of the hero Fingal, or Fin-maccoul, who is supposed here to have enjoyed the pleasures of the chace; and many places retain his name; but there is no authentic history that relates to the island till the time of Magnus the Barefooted, the Norwegian victor, who probably included Arran in his conquest of Kintyre. Arran was the property of the crown. Robert Bruce retired thither during his distresses, and met with protection from his faithful vassals. Numbers of them followed his fortunes; and after the battle of Bannockburn he rewarded several, such as the M'Cooks, M'Kinnons, M'Brides, and M'Louis, or Fullertons, with different charters of lands in their native country. All these are now absorbed by this great family, except the Fullertons, and a Stewart descended from a son of Robert III. who gave him a settlement here. In the time of the dean of the isles, his descendant possessed castle Douan; and 'he and his bluid,' says the dean, 'are the best men in that countrey.' About the year 1334 this island appears to have formed part of the estate of Robert Stewart, great Stewart of Scotland, afterwards Robert II. At that time they took arms to support the cause of their master; who afterwards, in reward, not only granted at their request an immunity from their annual tribute of corn, but added several new privileges, and a donative to all the inhabitants that were present. In 1456, the whole island was ravaged by Donald earl of Ross and lord of the isles. At that period it was still the property of James II. but in the reign of his successor James III. when that monarch matched his sister to Thomas lord Boyd, he created him earl of Arran, and gave him the island as a portion. Soon after, on the disgrace of that family, he caused the countess to be divorced from her unfortunate husband; and bestowed both the lady and island on Sir James Hamilton, in whose family it continues to this time, a very few farms excepted.—Arran is of great extent, being twenty-three miles from Sgreadan point north to Beinnean south; and the number of inhabitants are about 7000, who chiefly inhabit the coasts; the far greater part of the country being uninhabited by reason of the vast and barren mountains. Here are only two parishes, Kilbride and Killmore; with a sort of chapel of ease to each, founded in the last century by Anne duchess of Hamilton. The principal mountains of Arran are, Goatfield, or Gaoilbheinn, or 'the mountain of the winds,' of a height equal to most of the Scottish Alps, composed of immense piles of moor-stone, in form of wool-packs, clothed only with lichens and mosses, inhabited by eagles and ptarmigans, Beinbharrain, or 'the sharp-pointed;' Ceum-na-caillich, 'the step of the carline or old hag;' and Grianan-Athol, that yields to none in ruggedness. The lakes are Loch-jorsa, where salmon come to spawn; Loch-tana; Loch-nah-jura, on the top of a high hill; Loch-mhachrai; and Loch-knoc-acharbell, full of large eels. The chief rivers are, Abhan-mhor, Moina-mhor, Slondrai-machrei, and Jorsa; the two last remarkable for the abundance of salmon. The duke of Hamilton keeps a surgeon in pay, who, at certain times, makes a tour of the island. On notice of his approach the inhabitants of each farm assemble in the open air, extend their arms, and are bled into a hole made in the ground, the common receptacle of the vital fluid. In burning fevers, a tea of wood sorrel is used with success, to allay the heat. An infusion of ramsons, or allium ursinum, in brandy, is esteemed here a good remedy for the gravel.—The men are strong, tall, and well made; all speak the Erse language, but the ancient habit is entirely laid aside. Their diet is chiefly potatoes and meal; and during winter, some dried mutton or goat is added to their hard fare. A deep dejection appears in general through the countenances of all: no time can be spared for amusement of any kind; the whole being given for procuring the means of paying their rent, of laying in their fuel, or getting a scanty pittance of meat and clothing. The leases of farms are nineteen years. The succeeding tenants generally find the ground little better than a caput mortuum: and for this reason should they, at the expiration of the lease, leave the lands in a good state, some avaricious neighbours would have the preference in the next setting, by offering a price more than the person who had expended part of his substance in enriching the farm, could possibly do. This induces them to leave it in the original state. The metnod of setting a farm is very singular; each is commonly possessed by a number of small tenants; thus a farm of £40 a year is occupied by eighteen different people, who, by their leases, are bound, conjunctly and severally, for the payment of the rent to the proprietor. These live on the farm in houses clustered together, so that each farm appears like a little village. The tenants annually divide the arable land by lot; each has his ridge of land, to which he puts his mark, such as he would do to any writing: and this species of farm is called run-rig, i. e. ridge. They join in ploughing; every one keeps a horse or more; and the number of those animals consume so much corn as often to occasion a scarcity; the corn and peas raised being, much of it, designed for their subsistence, and that of the cattle, during the long winter. The pasture and moor land annexed to the farm is common to all the possessors. All the farms are open. Enclosures of any form, except in two or three places, are quite unknown; so that there must be a great loss of time in preserving their corn, &c. from trespass. The usual manure is sea plants, coral and shells. The run-rig farms are now discouraged; but since the tenements are set by roup or auction, and advanced by an unnatural force to above double the old rent, without any allowance for enclosing, any example

set in agriculture, any security of tenure by lengthening the leases, affairs will turn retrograde, and the farms relapse into their old state of rudeness; migration will increase, for it has begun, and the rents be reduced even below their former value: the late rents were scarcely £1200 a year: the expected rents £3000.

'The live stock of the island is 3183 milch cows; 2000 cattle, from one to three years old; 1058 horses; 1500 sheep; and 500 goats: many of the two last are killed at Michaelmas, and dried for winter provision, or sold at Greenock. The cattle are sold from forty to fifty shillings per head, which brings into the island about £1200 per annum. I think that the sale of horses also brings in about £300. Hogs were introduced here only two years ago. The herring-fishery round the island brings in £300; the sale of herring-nets £100; and that of thread about £300, for a good deal of flax is sown here. These are the exports of the island; but the money that goes out for the necessaries is a melancholy drawback. The produce of the island is oats; of which about 5000 bolls, each equal to nine Winchester bushels, are sown; 500 of beans, a few peas, and above 1000 bolls of potatoes, are annually set: notwithstanding this 500 bolls of oatmeal are annually imported, to subsist the natives. The women manufacture the wool for the clothing of their families; they set the potatoes, and dress and spin flax. They make butter for exportation, and cheese for their own use. The inhabitants in general are sober, religious and industrious; great part of the summer is employed in getting peat for fuel, the only kind in use here; or in building or repairing their houses, for the badness of the materials requires annual repairs: before and after harvest they are busied in the herring-fishery; and during winter the men make their herring-nets; while the women are employed in spinning their linen and woollen yarn. The light they often use is that of lamps. From the beginning of February to the end of May, if the weather permit, they are engaged in laboring their ground; in autumn they burn a great quantity of fern, to make kelp. So that, excepting at new-year's-day, at marriages, or at the two or three fairs in that island, they have no leisure for any amusements; no wonder then at their depression of spirits.' Arran forms part of the county of Bute, and is subject to the same sort of government; but, besides, justice is administered at the baron's baily court, who has power to fine as high as twenty shillings, can decide in matters of property not exceeding forty shillings, can imprison for a month, and put delinquents into the stocks for three hours, but that only during day-time.' In 1793 the number of inhabitants in the whole island amounted to 5804.

ARRAN, NORTH, an island of Ireland, situated on the coast of Donegal in Ulster.

ARRAN, South isles of, three islands on the west coast of Ireland, in the mouth of Galway Bay.

ARRAN, a town of Switzerland, seated on the Aar, twenty-five miles south-west of Baden. The diets of the Protestant cantons are held in it.

AR'RAND. Ang.-Sax. Ærendian; to bear or carry tidings, to deliver a message. Commonly written errand.

That with the noise of her he gan awake,
And to cal, and dresse him vp to rise.
Remembring him his *arrand* was to done
From Troilus, and eke his great emprise.
Chaucer. Troilus, book ii. fol. 158.

Such may be said to go out upon such an *arrand*.
Howell. Instruct. for For. Travels, p. 187.

ARRANGE', ARRANG'ER, ARRANGE'MENT. Fr. *ranger*, *arranger*, to order and dispose persons or things. To put in order, to dispose in an orderly manner, to methodise.

I chanced this day
To see two knights in travel on my way,
(A sorry sight!) *arranged* in battle new.
Faerie Queene.

How effectually are its muscular fibres *arranged*, and with what judgment are its columns and furrows disposed! *Cheyne.*

There is a proper *arrangement* of the parts in elastick bodies, which may be facilitated by use. *Id.*

In vain you attempt to regulate your expense, if into your amusements or your society disorder has crept. You have admitted a principle of confusion which will defeat all your plans, and perplex and entangle what you sought to *arrange*. *Blair.*

What organ it is that shall declare the corporate mind, is so much a matter of positive *arrangement*, that several states, for the validity of several of their acts, have required a proportion of voices much greater than that of a mere majority. *Burke.*

ARRANGEMENT, in rhetoric. See ORATORY.

AR'RANT, AR'RANTLY. Supposed to be derived from *errans*, participle of *erro*, to wander. Fr. *errant*, a wanderer, a vagabond, an outcast, destitute of character, and therefore rejected by society.

Country folks, who halloed and hooted after me, as the *arrantest* coward that ever showed his shoulders to the enemy. *Sidney.*

A vain fool grows forty times an *arranter* sot than before. *L'Estrange.*

Funeral tears are as *arrantly* hired out, as mourning clokes. *Id.*

And let him every deity adore,
If his new bride prove not an *arrant* whore.
Dryden.

ARRAS, a city of France, in the department of the Straits of Calais; formerly the capital of the ci-devant province of Artois. It is seated on a mountain; and the parts about it are full of quarries, where good stones are got for building. It is divided into two parts by a strong wall, a large fosse, and the rivulet Chrinchron, which, 100 paces below, falls into the Scarpe. They are both well fortified, enclosed by high ramparts and deep fosses, which in several places are cut out of the rock. Arras has four gates, and a strong citadel with five bastions. The most remarkable places are, the great square where the principal market is kept, full of fine buildings, with piazzas all round it; the lesser market, which contains the town-house, a very noble structure, with a high tower covered with a crown, on the top of which is a brazen lion which serves for a vane. In the midst of this market is the chapel of the Holy Candle, said to be brought by the Virgin Mary herself above 600 years ago, when the city was affected with divers diseases, and every one

that touched the candle was cured! The candle is kept in a silver shrine. This chapel has a steeple adorned with silver statues. The cathedral church of Notre Dame stands in the city. It is a very large Gothic building, extremely well adorned; the tower is very high, and has a fine clock embellished with little figures in bronze, which represent our Saviour's passion and pass before the bell to strike the hours The abbey church of St. Vedast is the greatest ornament of Arras, being adorned with a fine steeple and seats of admirable workmanship. The chimes are remarkable for the different tunes they play. There are ten parish churches. Arras is situated 12 miles S. W. of Douay. Long. 2° 50′ E., lat. 50° 20′ N.

ARRAS, or ARAXES, a river of Persia in Georgia, which arises in Georgia, and, running S. E. joins the Cyrus, and the united streams fall into the Caspian sea between Shirvan and Aderbeitzan.

ARRAY′, *v.* & *n.* } From the Ang.-Sax.
ARRAIS′MENT. } wrigan, to cover or cloak, dress, or set in order. Array, in law, is the exhibiting or setting forth the jury impanelled to try a cause. To challenge the array is to object to the jury altogether.

Hire riche *array* ne mighte not be told,
As wel in vessell as in hire clothing;
She was all clad in pierri and gold.
Chaucer. The Monke's Tale.

A rich throne, as bright as sunny day;
On which there sat most brave, embellished
With royal robes and gorgeous *array*,
A maiden queen. *Faerie Queene.*

Deck thyself now with majesty and excellency, and *array* thyself with glory and beauty. *Job* xl. 10.

Now went forth the morn,
Such as in highest heav'n, *array'd* in gold
Empyreal. *Milton.*

Wert thou sought to deeds,
That might require th' *array* of war; thy skill
Of conduct would be such, that all the world
Could not sustain thy prowess. *Id.*

In this remembrance, Emily ere day
Arose, and dressed herself in rich *array*. *Dryden.*
She seem'd a virgin of the Spartan blood,
With such *array* Harpalyce bestrode
Her Thracian courser. *Id.*

One vest *array'd* the corpse; and one they spread
O'er his closed eyes, and wrapp'd around his head.
Id.

The earl espying them scattered near the army, sent one to command them to their *array*. *Hayward.*

A general sets his army in *array*
In vain, unless he fight and win the day.
Denham.

At once *arrayed*
In all the colours of the flushing year,
By nature's swift and secret-working hand,
The garden glows, and fills the liberal air
With lavish fragrance; while the promised fruit
Lies yet a little embryo unperceived,
Within its crimson folds. *Thomson.*

To right and left the martial wings display
Their shining arms, and stand in close *array*,
Though weak their spears, though dwarfish be their height,
Compact they move, the bulwark of the fight.
Sir William Jones.

ARREAR′, *v.* & *n.* } Fr. *arrière*, behind.
ARREAR′AGE, } To put in the rear or
ARRIERE′. } back, to be behind hand, to omit (from any cause), to keep an account paid up in due time.

To leave with speed Atlanta swift, *arrear*;
Through forests wild and unfrequented land,
To chase the lion, boar, or rugged bear.
Faerie Queene.

When we have forgotten our sins, yet God remembers them, and, although not in anger, yet he calls for our *arrearages*. *Hall's Contemplations.*

He'll grant the tribute, send the *arrearages*.
Shakspeare.

Arrearage is the remainder of an account, or a sum of money remaining in the hands of an accountant; or, more generally, any money unpaid at the due time, as *arrearage* of rent. *Cowell.*

The horsemen might issue forth without disturbance of the foot, and the avant-guard without shuffling with the battail or *arriere*. *Hayward.*

Paget set forth the king of England's title to his debts and pension from the French king, with all *arrearages*. *Id.*

The old *arrearages* under which that crown had long groaned, being defrayed, he hath brought Lurana, to uphold and maintain herself.
Howel's Vocal Forest.

ARRECT′, *v.* & *adj.* *Arrigo*, *arrectum*, to set or lift up.

Arrectynge my sight toward the zodiake,
The signes twelve for to beholde afarre.
Skelton's Poems, p. 9.

Eager for the event,
Around the beldame all *arrect* they hang,
Each trembling heart with grateful terrors quell'd.
Akenside. Pleasures of Imagination.

ARREP′TION, } *Arripio*, *arreptus*, to snatch.
ARREPTI′TIOUS. } Snatching away. This epithet is, according to Ducange, applied to that which is supposed to be under a satanic or demoniacal influence, and therefore crack-brained, frantic, mad. Words of little worth.

The *arreption* was sudden; yet Elisha sees both the chariot, and the horses, and the ascent.
Hall's Contemplation.

They stick not to term their predictions of Christ to be mere mock oracles, and odd *arreptitious* frantic extravagancies. *Howell's Letters.*

ARREST′, *v.* & *n.* Old Fr. *arrester*, to seize. To stop, attach, detain, impede, check, interrupt, from the Ang.-Sax. restan, to rest.

This fals knight in his degree
Arrested was, and put in holde.
Gower. Con. A. bk. ii.

The battle of Lepanto *arrested* the greatness of the Turk. *Lord Bacon's Essays.*

But, when as Morpheus had with leaden maze
Arrested all that goodly company. *Faerie Queene.*

When Job's messengers told him the sad stories of fire from heaven, the burning his sheep, and that the Sabeans had driven his oxen away, and the Chaldeans had stolen his camels, these were sad *arrests* to his troubled spirit. *Jeremy Taylor.*

Age itself (which, of all things in the world, will not be baffled or defied) shall begin to *arrest*, seize, and remind us of our mortality. *South.*

This defect of the English justice was the main impediment, that did *arrest* and stop the course of the conquest. *Davies.*

As often as my dogs, with better speed,
Arrest her flight, is she to death decreed. *Dryden.*

Nor could her virtues, nor repeated vows
Of thousand lovers, the relentless hand
Of death *arrest*. *Philips.*

Then died Scamandrius, expert in the chace,
In woods and wilds to wound the savage race;
Diana taught him all her sylvan arts,
To bend the bow, and aim unerring darts;
But vainly here Diana's arts he tries,
The fatal lance *arrests* him as he flies.
Pope's Iliad, v. 65.

And it is hard
To feel the hand of death *arrest* one's steps,
Throw a chill blight o'er all one's budding hopes,
And hurl one's soul untimely to the shades,
Lost in the gaping gulf of black oblivion.
Kirke White's Poems.

And dun and sombre 'mid the holy calm,
Near Theseus' fane, yon solitary palm,
All tinged with varied hues, *arrest* the eye—
And dull were his that passed them heedless by.
Lord Byron's Corsair.

An ARREST, in a civil cause, is defined to be the apprehending or restraining one's person by process in execution of the command of some court. An arrest must be by corporeal seizing or touching the defendants body, after which the bailiff may justify breaking open the house in which he is, to take him; otherwise he has no such power, but must watch his opportunity to arrest him. For every man's house is looked upon by the law to be his castle of defence and asylum, wherein he should suffer no violence. Which principle is carried so far in the civil law, that for the most part, not so much as a common citation or summons, much less an arrest, can be executed upon a man within his own walls. Peers of the realm, members of parliament, and corporations, are privileged from arrests; and of course from outlawries. And against them the process to enforce an appearance must be by summons and distress infinite, instead of a capias. Also clerks, attorneys, and all other persons attending the courts of justice (for attorneys being officers of the court are always supposed to be there attending), are not liable to be arrested by the ordinary process of the court, but must be sued by bill called usually a bill of privilege, as being personally present in court. Clergymen performing divine service, and not merely staying in the church with a fraudulent design, are for the time privileged from arrests, by statute 50 Edw. III. c. 5, and 1 Rich. II. c. 16; as likewise members of convocation actually attending thereon, by statute 8 Henry VI. c. 1. Suitors, witnesses, and other persons necessarily attending any courts of record upon business, are not to be arrested during their actual attendance, which includes the necessary coming and returning. Seamen in the king's service are privileged from arrests for debt under £20, 1 Geo. II. c. 14, and 14 Geo. II. c. 38; and soldiers or marines are not liable to arrests for a debt of less than £10, 30 Geo. II. c. 6. 11. And no arrest can be made in the king's presence, nor within the verge of his royal palace, nor in any place where the king's justices are actually sitting. The king hath moreover a special prerogative, which indeed is very seldom exerted, that he may by his writ of protection privilege a defendant from all personal and many real suits, for one year at a time, and no longer; in respect of his being engaged in his service out of the realm. And the king also by the common law might take his credit into his protection, so that no one might sue or arrest him till the king's debt was paid; but, by the statute 23 Edw. III. c. 19, notwithstanding such protection, another creditor may proceed to judgment against him, with a stay of execution till the king's debt be paid; unless such creditor will undertake for the king's debt, and then he shall have execution for both. And lastly, by statute 29 Car. II. c. 7, no arrest can be made, nor process served, upon a Sunday, except for treason, felony, or breach of the peace. By 51st Geo. III. c. 124, the power of arresting in civil cases is confined to those in which £15 at the least was the original amount of the debt, except in cases of promissory notes and bills of exchange.

An ARREST, in a criminal cause, is the apprehending or restraining one's person, in order to be forthcoming to answer an alleged crime. To this arrest all persons whatsoever are, without distinction, liable; and doors may be broken open to arrest the offender; but no man is to be arrested, unless charged with such a crime as will at least justify holding him to bail when taken. There is this difference also between arrests in civil and criminal cases, that none shall be arrested for debt, trespass, or other cause of action, but by virtue of a precept or commandment out of some court; but for treason, felony, or breach of the peace, any man may arrest with or without warrant or precept. But the king cannot command any one by word of mouth to be arrested; for he must do it by writ, or order of his courts, according to law: nor may the king arrest any man for suspicion of treason, or felony, as his subjects may; because, if he doth wrong, the party cannot have an action against him. Arrests by private persons are in some cases commanded. Persons present at the committing of a felony must use their endeavours to apprehend the offender, under penalty of fine and imprisonment; and they are also with the utmost diligence to pursue and endeavour to take all those who shall be guilty thereof out of their view, upon a hue and cry levied against them. By the vagrant act, 17th Geo. II. c. 5, every person may apprehend beggars and vagrants; and every private person is bound to assist an officer requiring him to apprehend a felon. In some cases likewise arrests by private persons are rewarded by law. By the 4th and 5th William and Mary, c. 8, persons apprehending highwaymen, and prosecuting them to a conviction, are entitled to a reward of £40 and if they are killed in the attempt, their executors, &c. are entitled to the like reward. By the 6th and 7th William III. c. 17, persons apprehending counterfeiters and clippers of the coin, and prosecuting them to conviction, are entitled to £30. By 5th Anne, c. 31, persons who shall take one guilty of burglary, or the felonious breaking and entering any house in the day time, and prosecute them to conviction, shall receive the sum of £40 within one month after such conviction. Arrests by public officers, as watchmen, constables, &c. are either made by their own authority, which differs but very little from the power of a private

person; or they are made by a warrant from a justice of Peace. See WARRANT.

On the continent of Europe the method of procuring a man's appearance before a court of justice is different from the above: the forms introduced in the Roman civil law, in the reigns of the latter emperors, being adopted. The usual practice is to have the person sued summoned to appear before the court by a public officer belonging to it, a week before the time. If no regard is paid to such summons twice repeated, the plaintiff, or his attorney, is allowed to make before the court a formal reading of his demand, which is then granted him, and he may proceed to execution.

ARREST of judgment, in law, the assigning just reason why judgment should not pass; as want of notice of the trial; a material defect in the pleading; when the record differs from the deed impleaded; when persons are misnamed; where more is given by the verdict than is laid in the declaration, &c. This may be done either in criminal or civil causes.

ARREST, in horsemanship, a mangy humor between the ham and pastern of the hinder legs of a horse.

ARRESTANDIS BONIS ne dissipentur, a writ which lies for him whose cattle or goods are taken by another, who during the controversy is likely to make away with them, and will hardly be able to give satisfaction for them afterwards.

ARRESTANDO IPSUM qui pecuniam recepit ad proficiscendum in obsequium regis, &c. is a writ which lies for the apprehension of him that hath taken bounty-money to serve in the king's wars, and hides himself when he should go.

ARRESTMENT, in Scots law, signifies the securing of a criminal till trial, or till he find caution to stand, in what are called bailable crimes. In civil cases it signifies either the detaining of strangers or natives in meditatione fugæ, till they find caution judicio sisti, or the attaching the effects of a stranger in order to found jurisdiction. But in the most general acceptation of the word, it denotes that diligence by which a creditor detains the goods or effects of his debtor in the hands of third parties till the debt due to him be either paid or secured. See LAW, Index.

ARRESTO FACTO SUPER BONIS, &c. a writ brought by a denisen against the goods of aliens found within this kingdom, as a recompense for goods taken from him in a foreign country.

ARRETIUM, or ARRHETIUM, one of the twelve ancient towns of Tuscany, near the Arnis and Clanis, situated in a pleasant valley; now called Arezzo, forty-two miles east of Florence. See AREZZO.

ARETS, or ARRETES, in ichthyology, the back-bones of fishes.

ARRHABONARII; from *αρραβον*, earnest; a sect of Christians who held that the eucharist is neither the real flesh nor blood of Christ, nor yet the sign of them; but only the pledge or earnest thereof.

ARRHAPHON, a skull without sutures, found to be the cause of incurable cephalalgiæ.

ARRHENOGOGON, in botany, a name given by some to the parietaria, or pellitory of the wall.

ARRHEPHORIA, a feast among the ancient Athenians instituted in honor of Minerva, and Herse daughter of Cecrops. The word was composed of *αρρητον*, mystery, and *φερω*, I carry; on account of certain mysterious things which were carried in procession at this solemnity. Boys, or, as some say, girls, between seven and twelve years of age were the ministers that assisted at this feast, and were denominated *αρρηφοροι*. This feast was also called Hersiphoria, from Herse, already mentioned.

ARRIA, the virtuous and heroic wife of Pœtus, who being condemned to death unjustly, along with her husband, by the tyrant Nero, first stabbed herself, and then gave the dagger to her husband, saying 'Pœtus, it is not painful.' Martial's epigram on this subject is well known, but it is remarked that he has given an ingenious turn to the speech, which injures its noble simplicity:

Casta suo gladium cum traderet Arria Pœto,
Quem de visceribus traxerat ipsa suis;
Si qua fides, vulnus quod feci, non dolet, inquit,
Sed quod tu facies, hoc mihi, Pœte dolet.

When Arria drew the dagger from her side,
Thus to her consort spoke th' illustrious bride:
'The wound I gave myself I do not grieve;
I die by that which Pœtus must receive.'

ARRIAGA (Roderic d'), a learned Spanish Jesuit, born in 1592. He became professor in theology and philosophy at Prague, where he died in 1667. He wrote a Course of Philosophy, and of Theology. The former was printed at Antwerp in 1532, and the latter in 1683; 8 vols. folio.

ARRIAGI, in the materia medica, a name given by some authors, particularly by Serapion and Avicenna, to a fine kind of camphor.

ARRIAN, a famous Grecian philosopher and historian of the second century. He was born at Nicomedia in Bithynia, and flourished under Adrian and the two Antonines. He united in himself the character of a warrior and a philosopher. His great learning and eloquence procured him the title of the 'second Xenophon;' and raised him to the consulship and most considerable dignities at Rome. His History of Alexander the Great, in seven books, is admired by the best judges. He also wrote a book on the affairs of India, which pursues the history of Alexander, but is not deemed of equal authority with the former. An epistle from Arrian to Adrian is also extant, entitled Periplus Ponti Euxini. There are besides, a Treatise on Tactics; a Periplus of the Red Sea; his Enchiridion, a Treatise containing the Discourses of Epictetus. The best editions of Arrian are that of Gronovius, Greek and Latin, 1704, folio; of Raphelius, Greek and Latin, Amsterdam, 1750, 8vo.; and of Schneider, Leipsic, 1798. An English translation of his History of Alexander was published by Rooke in 2 vols. 8vo. 1729.

ARRIDE'. *Ad rideo*, to smile at. To look pleasantly upon one, to manifest a pleasing satisfaction.

FAST. 'Fore heavens, his humor *arrides* me exceedingly.

CAR. *Arrides* you?

FAST. I, *pleases* me (a pox on't) I am so haunted at the court, and at my lodging, with your refined choise spirits, that it makes me cleane of another garbe, another sheafe, I know not howe I cannot frame me! to your harsh vulgar phrase, 'tis against my genius.

Ben Jonson. Every Man out of his Humour.

ARRIEGE, a river of France, which rises among the Pyrenees, runs through the department, and passing by Foix and Pamiers, falls into the Garonne near Toulouse. Gold-dust has been found amongst its sands.

ARRIEGE, or ARIEGE, a department of France, which takes its name from the river Arriege, is bounded on the east by the department of the Aude, on the south by a part of the Pyrenean mountains, and on the west and north by the department of the Upper Garonne. Its extent is 244 square leagues, and its population, according to the most recent returns, 222,936. It is divided into three arrondissements, viz. that of Foix, that of Pamiers, and that of St. Girons, This department forms, with that of the Haute Garonne, the diocese of the archbishop of Toulouse. The general aspect of the country is mountainous, and there are several mines of lead, copper, and iron. The climate, which is very cold on the mountains, is warm in the valleys and plains. The many pastures render the herds of cattle numerous and thriving. The principal objects of culture and trade are cattle, resin, turpentine, pitch, cork, and particularly iron. Corn is not grown in sufficient quantity for home consumption.

ARRIERE BAN; Casseneuve derives this word from arriere and ban; ban denotes the convening of the nobless or vassals, who hold fees immediately of the crown; and arriere, those who only hold of the king immediately. A general proclamation, by which the king of France summons to the war all that hold of him, both his own vassals or the noblesse, and the vassals of his vassals.

ARRIERE FEE, or Fief, is a fee dependent on a superior one. These fees commenced when dukes and counts, rendering their governments hereditary, distributed to their officers parts of the domains, and permitted those officers to gratify the soldiers under them in the same manner.

ARRIGHETTO, or ARRIGO, a Florentine poet of the twelfth century. He took holy orders, and obtained the benefice of Calvazo, which he lost from some irregularity. He made his misfortunes the subject of his poems, printed first in 1684, which are still popular for the elegance of their style, and the pensive melody of their versification.

ARRIVE', ARRIV'AL, ARRIV'ANCE. Fr. *arriver*, perhaps from the Fr. *rive*, the shore. To approach the shore, to come to, to reach, to attain; applied to persons, or what is personified.

Every minute is expectancy
Of more *arrivance*. *Shakspeare.*

Bid him [the intellect] soar up to heaven, and thence down throwing
The centre search, and Dis' dark realm, he's gone,
Returns, *arrives*, before thou saw'st him going;
And while his weary kingdom safely sleeps,
All restless he watch and warding keeps,
Never his carefull head in resting pillow steeps.
Fletcher's Purple Island.

Happy to whom this glorious death *arrives*;
More to be valued than a thousand lives. *Waller.*

How are we changed, since first we saw the queen!
She, like the sun, does still the same appear;
Bright as she was at her *arrival* here. *Id.*

It is the highest wisdom, by despising the world to *arrive* at heaven; they are blessed who converse with God. *Taylor.*

The virtuous may know in speculation, what they could never *arrive* at by practice; and avoid the snares of the crafty. *Addison.*

The citizen, above all other men, has opportunities of *arriving* at the highest fruit of wealth to the liberal without the least expense of a man's own fortune. *Steele.*

Old men love novelties; the last *arrived*
Still pleases best, the youngest steals their smiles.
Young.

The unravelling is the *arrival* of Ulysses upon his own island. *Broome's View of Epic Poetry.*

ARROE, a small island of Denmark, in the Baltic Sea, a little south of the island of Funen, and north of that of Dulcen. It is eight miles in length and about two in breadth; and produces corn, aniseed, black cattle, and horses. It has three parishes, the most considerable of which is Koping. It stands at the south side of the island, in the bottom of a bay, and has a port with some trade. Long. 10° 20 E., lat. 55° 10′ N.

AR'ROGATE, AR'ROGANCE, AR'ROGANCY, AR'ROGANT, AR'ROGANTLY, ARROGA'TION, ARROG'ATIVE. *Adrogo, adrogatum*, to ask for or seek after. To claim too much consequence, to ask for more honor, merit, or consideration than is due. To think too highly of one's self, and to exact the same estimation from others, to make unjust pretensions.

The speech of Themistocles the Athenian, which was haughty and *arrogant*, in taking so much to himself, had been a grave and wise observation and censure applied at large to others. Desired at a feast to touch a lute, he said he could not fiddle, but yet he could make a small town a great city.
Lord Bacon's Essays.

Feagh's right unto that country, which he claims, or the seignory therein, must be vain and *arrogant*.
Spenser on Ireland.

Who, not content
With fair equality, fraternal state,
Will *arrogate* dominion undeserved
Over his brethren. *Milton.*

An *arrogant* way of treating with other princes and states, is natural to popular governments.
Temple.

Rome never *arrogated* to herself any infallibility, but what she pretended to be founded upon Christ's promise. *Tillotson.*

What is so hateful to a poor man as the purse-proud *arrogance* of a rich man.
Cumberland.

I must confess I was very much surprised to see so great a body of editors, critics, commentators, and grammarians, meet with so very ill a reception. They had formed themselves into a body, and with a great deal of *arrogance* demanded the first station in the column of knowledge; but the goddess, instead of complying with their request, clapped them into liveries. *Addison.*

After having thus ascribed due honor to birth and parentage, I must, however, take notice of those who *arrogate* to themselves more honors than are due to them on this account. *Id.*

ARROJO DE ST. SERVAN, a town of Spain, in Estremadura, three miles south of Merida.

ARRONDEE, in heraldry, a cross, the arms of which are composed of sections of a circle, not opposite to each other, so as to make the arms bulge out thicker in one part than another; but the sections of each arm lying the same way, so that the arm is everywhere of an equal thickness, and all of them terminating at the edge of the escutcheon like the plain cross.

ARROQUHAR, a parish of Scotland, in Dumbartonshire, fourteen miles long and about four broad. In the Gaelic it is pronounced Arrar and Ardthir, i. e. high country; which is descriptive of the place, as it is almost wholly mountainous; notwithstanding which the climate is temperate

ARROTINO, in sculpture, a celebrated antique statue in the gallery of the great duke of Florence, representing an old man naked, resting on one knee, and whetting a knife upon a stone, with his head in an attitude of listening. According to Millin, there is in its expression a ferocious smile, and he supposes it the image of a slave, who, while sharpening his knife, overhears some plan of a conspiracy; perhaps that of Vindex, who discovered the conspiracy of the sons of Brutus; or of Milichus, who informed Nero of the projects of his master Scevinus and the Pisos against him.

ARROUX, a river of France in the department of Cote d'Or, which passes through Autun, and falls into the Loire, between Bourbon Lancy and Digoin.

AR'ROW } Ang.-Sax. arwe, from arwian,
AR'ROWY. } to prepare. The pointed weapon of any material prepared to be shot from a bow.

I swear to thee by Cupid's strongest bow,
By his best *arrow* with the golden head.
Shakspeare.

He saw them, in their forms of battle ranged;
How quick they wheel'd, and flying behind them shot
Sharp sleet of *arrowy* show'r against the face
Of their pursuers, and o'ercame by flight. *Milton.*

For this day will pour down,
If I conjecture aught, no drizzling show'r,
But rattling storm of *arrows* barb'd with fire.
Id.

Here were boys so desperately resolved, as to pull *arrows* out of their flesh, and deliver them, to be shot again, by the archers on their side. *Hayward.*

Mean time the virgin huntress was not slow
T' expel the shaft from her contracted bow;
Beneath his ear the fastened *arrow* stood,
And from the wound appear'd the trickling blood.
Dryden's Fables.

Say, from what golden quivers of the sky,
Do all thy winged *arrows* fly?
Swiftness and power by birth are thine,
From thy great sire they came, thy sire the word divine. *Cowley.*

ARROW, in fortification, is a work placed at the salient angles of the glacis and consists of two parapets, each forty toises long. This work has a communication with the covert way, of about twenty-four or thirty feet broad, called caponier; and a ditch before it, of five or six toises.

ARROW, in surveying, is used for small straight sticks, about two feet long, shod with iron ferrils. Their use is to stick into the ground at the end of the chain.

ARROW-HEAD, from arrow and head; a water plant, so called from the resemblance of its leaves to the head of an arrow.

ARROW-HEADS, or ARROW-STONES, in antiquity, pieces of barbed flint, thin and sharp at the points, with which our ancestors armed their arrows. Specimens of them are often found in various places of Scotland, and preserved by antiquarians. The inhabitants of some of the South Sea islands head their arrows with stone, others with bones; metal being unknown among them.

ARROW, MAGICAL, a sort of weapon very common among the barbarous inhabitants of Lapland, and many of the northern climates; and supposed to possess very strange virtues.

ARROW-MAKERS are also called fletchers; and were formerly, as well as bowyers, persons of great consequence in the kingdom. Arrow-heads and quarrels were to be well boched or brased, and hardened at the points with steel; the doing of which seems to have been the business of the arrow-smith.

ARROWSMITH (Aaron), hydrographer to his majesty, an individual of high celebrity, as a constructor of maps and charts. His many valuable works, frequently adverted to as standards for comparison and reference, sufficiently attest the extent of his researches and the general accuracy of his observations. He published a New General Atlas, 4to. 1817, to accompany the Edinburgh Gazetteer, and also a vast number of maps and charts of the world and of various regions, many of which are noticed with approbation in the catalogue at the end of Pinkerton's Geography. He was also the author of a pamphlet, entitled, A Companion to a Map of the World, containing much useful information.

ARS, Latin, from *αρος*, utility, Greek. Art. The word is often conjoined with adjectives expressing particular, real, or pretended arts; such as,

ARS NOTORIA, a pretended manner of acquiring sciences by infusion, without any application, except fasting, and performing certain ceremonies. This art was condemned by the Sorbonne, A. D. 1320.

ARS THESSALICA, the Thessalian art, is used by ancient writers for a species of magic, whereby it was pretended they could draw the moon and stars out of heaven! It was denominated Thessalian from its supposed inventors, the people of Thessaly.

ARSACES I., king of Parthia, was a man of obscure origin, who, upon seeing Seleucus defeated by the Gauls, invaded Parthia, and conquered the governor of the province called Andragoras, and laid the foundations of an empire, 250 years B. C. He added the kingdom of the Hyrcani to his newly acquired possessions, and spent his time in establishing his power, and regulating the laws. He reigned thirty-eight

years, and was killed in battle against Ariarathes IV. king of Cappadocia.

Arsaces II., son of the preceding, succeeded his father on the throne of Parthia. He maintained a powerful opposition to Antiochus the Great; and it seems probable this is the king of Parthia spoken of in the first book of Maccabees, xiv. 2, who considerably enlarged the kingdom of Parthia, by his good conduct and valor. See Parthia. He was succeeded by his son Arsaces Priapatius.

Arsaces Tiranus, king of Armenia, was treacherously made captive by Sapor king of Persia, who ordered him to be bound with silver chains, after which he was confined in a prison at Ecbatana, in which he died A. A. C. 1632; and Armenia then became a province of Persia.

ARSAMAS, a town of Russia, in the territory of Morduates, seated on the river Mockcha-reca, on the road to Astracan, 500 miles south by east from Moscow, and 500 north by west from Astracan. At this place Gen. Dolgorucki punished the rebellious Cossacks

ARSCHIN, a long measure used in China to measure stuffs; of the same length with the Dutch ell, which is 2 feet 11 lines. Four arschins make three yards English.

ARSELLA, in botany, a name given by some of the Greek writers to the argemone, a kind of wild poppy; and by others to the common agrimony.

AR'SENAL. Ital. *arsenale*, perhaps from *arce navale*. An armory, a depot of military or naval stores.

> Walled towns, stored *arsenals*, and armories; goodly races of horse, chariots of war, elephants, ordnance, artillery, and the like. All this is but a sheep in a lion's skin, except the breed and disposition of the people be stout and warlike.
>
> *Lord Bacon's Essays.*

> I would have a room for the old Roman instruments of war, where you might see all the ancient military furniture, as it might have been in an *arsenal* of old Rome. *Addison.*

Arsenal. The arsenal of Venice, the place where galleys were built and laid up. The arsenal of Paris, that where the cannon or great guns were cast; having this inscription over the gate:

> Ætna hæc Henrico Vulcania tela ministrat,
> Tela Gigantæos debellatura furor.

Arsenals are also appropriated to naval furniture and equipments. In an arsenal of consequence, all the proper departments connected with the artillery service are provided with suitable buildings and accommodations applicable to their particular branches; such as the foundry, for casting of brass ordnance; the carriage department, which includes the wheelers, carpenters, and smiths; the laboratory, for making up and preparing all kinds of ammunition; as well as all other departments requisite, according to the extent of the arsenal.

The Royal Arsenal at Woolwich is where stores, &c. belonging to the royal artillery are deposited. It was formerly called the warren.

ARSAMATIAS, in ancient geography, a river of Armenia, over which the Parthians compelled the Romans to build for them a bridge. Lipsius has without sufficient reason, corrected the text of Tacitus, and called it Arsanias.

ARSANE, a town of Palestine, in which Asa, king of Israel was buried, according to Josephus.

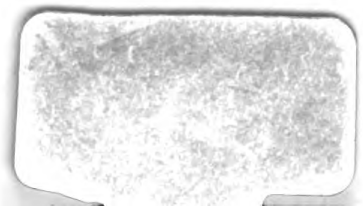
ARSANIAS, Arsen, a river of Asia, which had its source in the mountains east of the Euphrates, and passing through a small lake, traversed the south-west between the mountains, passed by Arsamosata, and discharged itself into the Euphrates to the south-west of that city. Pliny, Dion, Plutarch, and Tacitus, mention this river; and the latter says, that it ran between Tigranocerta and Artaxata.

ARSARATHA, a town of Asia, in Armenia Major.

ARSE Verse, in antiquity, a term or formula inscribed on doors to prevent fire. It is said to be of Tuscan origin, where the word arse signifies avert, and verse, fire.

ARSEMINI, in geography, a town of the island of Sardinia, seven miles south-west of Cagliari.

ARSEN, in ancient geography, a river of the western part of Arcadia, which ran from the north-east to the south-west, and discharged itself into the river Ladon.

ARSENA, a name given by Strabo to the lake Arethusa, in Armenia Major.

ARSENARIA, in ancient geography, a Roman colony of Africa, in Mauritiana Cæsariensis. This town was an episcopal see. It corresponds to the modern Arzew.